SUPERIOR
Manufacturing & Hydraulics

TECHNICAL MANUAL

5 1/2" H.T. CLINCHER® TONG
AND
6 3/8" S.H.T. BACKUP OR
5 1/2" LOCKJAW™ DRILL PIPE BACKUP

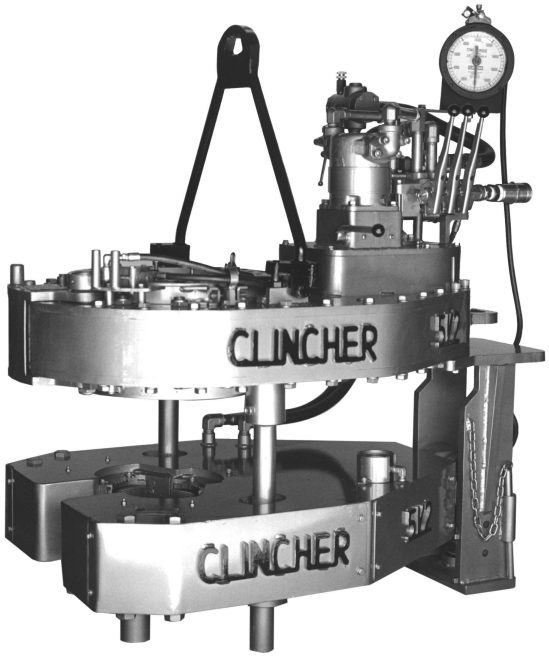

Photo represents typical 5 1/2" STD Tong & Backup
5 1/2" HT Tong & 6 3/8" SHT Backup are similar

COVERS
TONG MODELS CLES5500HT-03
AND
BACKUP MODELS BUC6375 & 01 / BUCD5500

4225 Highway 90, East
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Published 12/2008

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The products described in this manual are covered by U.S. and foreign Patents and/or pending Patent Applications.

This manual is not a controlled document and is subject to revision without notice. To receive updates and insure you have access to the latest information concerning the 5 1/2" H.T. **CLINCHER®** Tong and 6 3/8" S.H.T. Backup or 5 1/2" **LOCKJAW™** Drill Pipe Backup, we request you complete this form and return the lower half to SUPERIOR Manufacturing and Hydraulics by mail or facsimile. Access to our manuals can also be acquired through our web site www.superior-manf.com. Select the tab '**CLINCHER®** Products', select the equipment from the list to get Specs page, select the tab 'Download Manual'.

Name: _____
Company: _____
Address: _____
Address: _____
City: _____ **State:** _____
Postal Code: _____ **Country:** _____
Telephone: _____ **Fax:** _____

Tong Model No.: _____ **Serial No.:** _____
Backup Model No.: _____ **Serial No.:** _____
Assembly Date: _____

- - - -

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5 1/2" H.T. CLINCHER® TONG & 6 3/8" S.H.T. or 5 1/2" LJ DP Backup

REVISION TABLE

Section	*Page*	*Date*	*Description*
2	4	03/03/04	Revised Specs, changed Gripping Range for **LOCKJAW™** DP Backup from 3/8" to 1/4" undersize.
3	all	03/03/04	Added Dovetail Straight Tooth & Diamond Tooth Die information. Added chart Gripping Range, Adapters & Dovetail Die Inserts for 5 1/2" LJ Backup for Drill Pipe. Added Wrap Around Die chart for BUC5500 & BUCD5500. Replaced Tech Update Rev.5.0 with Rev.6.0.
Cover Title Pg 3 12	Cover Title Pg 5-8 3-8	05/2007	Removed ISO emblems.
2	5	05/2007	Revised Hydraulic Schematic.
3	3-16	05/2007	Added BUCD5500 Die & Adapter information and illustration. Corrected Dovetail Die Chart, length of dies from 5" to 3 7/8". Added docs LF Jaw Tech. & **GRIT FACE™** Coating.
7	3-35	05/2007	Removed Parts Lists.
9	TOC 23-24 4-5, 12.1	05/2007	Added DT Jaw Assy. & LF DT Jaw Assy. Revised illustrations: Tong Assy. sht.2 & sht.3 (Ring Gear PN chg. mfg. starting 05/04), Shift Box Assy.
10	6, 8, 10-14	05/2007	Revised illustrations: Cylinder Assy. BUC6523, Valve Bank Assy., DP Backup Assy. (Doors were backwards), DP Backup w/o Top Plate (Doors were backwards), Cylinder Assy. BUCD5524, Inside Door Assy., Outside Door Assy.
13	All	05/2007	Replace Rineer Motor Manual with Publication DS151005 8/03.
14	All	05/2007	Replaced Valve information with current publications. Added Dump Valve illustration & Electrical Connector Assy.
3	4 7	02/2008	Added sizes 2 3/8" thru 5 1/4" using dovetail die adapters BUDT55-XXXX. Revised 5 1/2" uses BUCX55005500. Revised LJ DP Backup DT Adapter/Die Chart.
10	15	02/2008	Revised illustration Backup DT Die Adapter.
Cover Title Pg.	Cover Title Pg.	03/2008	Added Tong Model CLES5500HT-02 & Backup Model BUC637501.
9	1, 18.1	03/2008	Added illustration Open Side Handle Weldment No. 51112.
10	3	03/2008	Revised illustration 6 3/8" Backup Top View.
14	49-50	03/2008	Added information on Relief Valve BUCI5514.

5 1/2" H.T. CLINCHER® TONG AND 6 3/8" S.H.T. OR 5 1/2" LOCKJAW™ DP BACKUP

HAZARD WARNING

Nomenclature used in this manual:

WARNING	concerns an operating procedure or practice that, if not strictly observed, can result in injury to personnel or loss of life.
Caution	concerns an operating procedure or practice that, if not strictly observed, can result in damage to or destruction of equipment.
Note	concerns an operating procedure or practice that needs highlighting.

CLINCHER® Tongs and Backups are manufactured to provide a means of making up or breaking out high torque tubular connections. They utilize high pressure hydraulic fluid power which can cause the tong to move suddenly and with great force if the tong is not properly rigged up and operated. **CLINCHER®** Tongs and Backups contain rotating and reciprocating parts which can severely or fatally injure personnel who are operating, repairing, or near this equipment during its operation. **WARNING: Tongs and Backups are not to be operated by untrained personnel or personnel with diminished physical or mental capacity. No work of any type, including changing of dies, is to be carried out while the tong and backup are connected to any hydraulic power unit.**

CLINCHER® Tongs and Backups are heavy tools. They should be suspended from a secure, high strength 7/8" 1 WRC minimum diameter wire cable with a 31 ton minimum breaking strength. The wire rope should be hung as close to the center of the wellbore as possible, without interfering with drilling equipment operation, to allow the tong to be readily swung into the working position. Vertical position control should be achieved by means of a **CLINCHER®** hydraulically operated lift cylinder/spring hanger. **WARNING: Users must insure the entire suspension system including cables, rig mounting points, lift cylinders, tong lifting brackets/bridles, winches, pulleys, counter weights, etc., are capable of handling the static weight of the tong plus any loads which could be transferred to it during the makeup or breakout process PLUS any shock loads which may be seen during operation. This system must readily allow downward movement equal to a minimum of the thread makeup distance to avoid overloading the suspension system and/or damage to equipment.**

A 3/4" IWRC minimum diameter wire cable with a 29.4 ton minimum or better breaking strength, should be attached at a 90 degree angle to the tong and at the same level to insure proper readout of torque indicator. A SNUBBING LINE should always be attached even when an integral backup is in use to provide additional safety in the event of a backup slippage. **WARNING: Users must provide a means of safely controlling the tong movements in all directions when it is in use. Failure to account for the its size, weight, movement and the amount of torque developed could result in personnel injury or death.**

5 1/2" H.T. CLINCHER® TONG AND 6 3/8" S.H.T. OR 5 1/2" LOCKJAW™ DP BACKUP

HAZARD WARNING

CLINCHER® Tongs and Backups utilize high pressure hydraulic fluids. Portions of the tong and backup, control valves, hydraulic lines and cylinders may contain high pressure fluid even when the power unit is de-energized and the fluid supply hoses are disconnected. During normal operation the temperature of the hydraulic fluids as well as hoses, piping, valves, etc., can rise to a level which can cause burns. **WARNING: Personal protective gear including safety glasses, face shields, protective gloves and protective clothing must be worn to guard against the hazards of high pressure fluids. Tight fitting clothing is required to prevent entanglement in rotating components. These tools should be serviced by thoroughly trained and qualified hydraulic technicians using procedures to safely insure hydraulic pressure is bled from these circuits.**

The **CLINCHER®** Tong is equipped with a door interlock system which prevents tong rotation whenever the door is open. This system is to be tested before each mobilization and at every shift change. Should this system be determined to be inoperative, the tong is to be removed from service and tagged as ***in-operative*** until repairs are made. **CAUTION:** Operating the tong with the door in the open position could result in severe damage to the equipment and will void all manufacturer warranties. **WARNING: Operating the tong with the door open by means of a defective or bypassed door interlock system exposes the operator and nearby personnel to potentially fatal hazards.**

No attempt should be made to operate the **CLINCHER®** Tong and Backup for any purpose other than which it is intended. This system is capable of generating very large clamping forces and torsional loads which, if improperly applied or controlled, could result in damage to the tubular, to the tong or backup, or could possibly result in injury or death of personnel. Do not attempt to operate the unit without correct dies and the proper size tubular being in the tong. See Section 3 for more information concerning the selection and use of dies. **CAUTION: Operating this equipment without the correct size, type and orientation of dies can result in damage to the equipment or tubulars being handled.**

HYDRAULIC PRODUCT SAFETY

WARNING: Valve lever (spool) may "stick" (not center) under certain conditions allowing the hydraulic equipment to continue to operate and could cause serious injury, death or equipment failure.

VALVE SAFETY: Read and follow instructions carefully. Failure to observe instructions and guidelines may cause serious injury, death or equipment failure. A sticking valve (spool bind) may be caused by one or more of the following factors:

DIRTY OIL: Oil must be filtered to a minimum of 25 microns. Filters should be changed regularly - spin-on types after 50 hours of initial use and then after every two hundred fifty hours of use. Use of a condition indicator is recommended. Consult your tractor or implement owner's manual for filtration and changing recommendations for internal systems.

OIL REQUIREMENTS: Premium quality anti-wear type oil with a viscosity between 100 and 200 SSU at operating temperatures. Certain synthetic oils may cause spool seals to swell and the valve to stick. If in doubt, call CROSS Engineering.

IMPROPER HOOK UP OR MOUNTING: Always use the proper size fittings. Hook up "in" & "out" as noted on the valve body. Do not overtorque pipe fittings. Mounting surfaces should be flat and care should be used when tightening mounting bolts. Over-tightened bolts can cause spool bind and casting breakage. When hooking a valve in series, always use a power beyond sleeve. Consult your tractor or implement manual to make sure you have the proper quick disconnect line connected to the inlet of the remote valve.

MISAPPLICATION: Always use the proper valve for the job. CONVERTA, CD, CS or CA valves should never be used for metered heavy load lifting - loaders or similar applications. Use an open center valve for open center applications and a closed center valve for closed applications. If in doubt, check with your tractor dealer. Contact CROSS if the valve allows the hydraulic equipment to creep excessively.

MAINTENANCE: Make sure all bolts are tightened and torqued to the recommended specification. Bent or broken parts should not be used. Replace immediately. Always use exact replacements. Always protect valve spool from paint overspray.

Faulty quick disconnects can cause high back pressures and sticking spools. Check quick disconnects periodically to make sure they are functioning properly. If valve spool does not center or appears to stick, do not use!

PUMPS & MOTORS SAFETY:

A relief or bypass in your hydraulic system is necessary to prevent pump from breakage due to overpressurization. Use correct fittings and proper oil as noted in the technical service manual packed with each unit. Change oil as recommended by your implement or tractor manufacturer.

CYLINDER SAFETY:

Check clevis clearances before, during and after extending the cylinder and before using the cylinder under pressure to avoid possible injury, or bent or broken rods caused by binding. Never operate a cylinder above recommended pressures. Never use a cylinder as a safety device when transporting equipment.

PINHOLE LEAKS:

If you observe a pinhole leak, discontinue use of the component. If oil has penetrated your skin or contacted your eye, seek medical attention immediately!

DESCRIPTION and APPLICATION

The **CLINCHER®** Tong and Backup system is an "open-throat" design which can handle tubulars as small as 2 1/16 inches to as large as 5 1/2" inches in diameter. The BUC6375 Backup can accommodate tubulars as large as 6 3/8 inches. The BUCD5500 Backup can accommodate tubulars as large as 5 1/2 inches. This system features two (2) jaws in the Tong and three (3) jaws in the Backup which encircle the pipe. Wrap Around jaws and dies, combined with our low friction jaw technology and constant radial load cam system and compensating jaw design provide exceptional gripping capabilities with reduced pipe deformation, stress, and marking. Using our non-marking aluminum die system or **GRIT FACE™** dies in the Tong and Backup will now allow stainless steel corrosion resistant alloys (CRA) to be run as quickly and easily as a traditional tong runs conventional steel tubulars.

Notable Features and Benefits

Low Friction Jaws	increases cam angle efficiency to allow use of aluminum dies
Splined Die System	aligns the die with the tubular and more evenly distributes radial load, essentially wrapping the die around the tube reduces pipe stress, deformation, and minimizes marking
Constant Cam Angle	insures an adequate radial load is available regardless of relative rotation to enhance performance on undersized pipe
Die Retention Method	provides an enhanced method of preventing equipment damage and die loss if the pipe is inadvertently moved while the tong is still gripping the pipe
Self Adjusting Brake	eliminates need to manually adjust brake bands to compensate for normal wear

In addition to these unique features listed above, the **CLINCHER®** Tong and Backup System is also equipped with numerous standard features including:

Door Interlock	prevents tong ring gear rotation whenever the tong door is open but allows control and operation of the lift cylinder at all times
Encoder Adapter	accepts customer's turns encoder to signal to a torque/turn computer
Pressure Control Valve	adjustable pressure control valves allow the customer to limit the amount of pressure applied and torque developed

The features described above are covered by US and foreign patents or pending US and foreign patents.

DESCRIPTION and APPLICATION

Tong Application

After completing the make-up or break-out cycle, the jaws are opened by reversing the tong motor to drive the ring gear and cam surfaces in the opposite direction until the reversing pin contacts the ring gear shoulder. Springs are used to return the jaws to their fully open position.

The Tong's cage plate braking system is self adjusting to compensate for brake band wear. Field adjustments are not required under normal conditions.

Backup Application

The **CLINCHER®** SHT Backup's front jaws are hydraulic cylinders. During a jaw closing cycle, the front jaws advance and clamp the pipe against the fixed rear jaw. Once locked on the pipe, pressure is locked in the backup cylinder by a load holding valve. When opening, the front jaws retract to allow the pipe to be removed.

The **CLINCHER® LOCKJAW™** DP Backup has an "open throat" design with three jaws that encircle the pipe. The front jaws are operated by cam surfaces on the rear jaw cylinder. During a jaw closing cycle, the front jaws swing in and interlock as the rear die approaches the pipe. Once locked on the pipe, pressure is locked in the backup cylinder by a load holding valve. When opening the backup jaws, the cylinder operation is reversed to retract the rear die and unlock the jaws. Springs move the front jaws to their fully open position.

SPECIFICATIONS

Maximum Torque	17,000 ft.lbs./23,049 Nm
Maximum Operation Pressure	3,000 psi/207 Bar
RPM @ 35 GPM/133 LPM: Manual Gearbox **Max Allowable Flow Rate: 40 GPM/151 LPM** **(Using Standard A-20 Valve Package)** **Max Allowable Flow Rate: 60 GPM/227 LPM** **(Using Optional A-35 Valve Package)** **High** **Low**	 58 12
5 1/2" H.T. Tong Handle Length	24 1/2"/62.2 cm
6 3/8" S.H.T. Backup Handle Length	29"/73.7 cm
Overall Length 5 1/2" HT Tong & 6 3/8" S.H.T Backup	50 1/2"/128.3 cm
Overall Width w/ Handles **Overall Width w/o Handles / HT Tong & SHT Backup**	30 1/4"/ 76.8 cm 28 3/4"/ 73.0 cm
Overall Height w/ SHT Backup	51"/129.5 cm
Overall Height w/ SHT Backup & Lifting Bracket	63 1/2"/161.3 cm
Weight Tong (approximate) **Weight 6 3/8" S.H.T. Backup (approximate)** **Bottom Hanger (approximate)** **Tong Legs (approximate)** **Combined Weight Tong w/ 6 3/8" S.H.T. Backup w/ Hanger & Legs (approximate)**	900 lbs./408.2 kg 515 lbs./233.6 kg 225 lbs./102.1 kg 50 lbs./ 22.7 kg 1,690 lbs./766.6 kg
Tong Jaw Options	2 1/16" thru 3 1/2" 3 1/2" thru 5 1/2"
1 BUC6375 Backup Jaw Size	2 1/16" thru 6 3/8"
Gripping Range for Dovetail Tong Jaws (under nominal jaw or adapter sizes)	3/8" / 1.5 cm undersize
Gripping Range for SHT Backup dressed with Dovetail Adapters	3/8" / 1.5 cm undersize

Operates using Steel Tooth Wrap Around Dies, **GRIT FACE™** Wrap Around Dies, and Aluminum Wrap Around Dies.

Standard Equipment:
- Door Interlock
- Self Adjusting Brake
- Tong Handles

Optional Equipment:
- Two Speed Hydraulic Motor
- Hydraulic Cage Plate Brake System
- Hydraulic Intensifier for Backup
- Varying Outlets for Torque Turns Computer Sending Units
- 3 Point Lifting Bridle
- Electronic Solenoid DumpValve
- Shipping Stand, or Skid

SPECIFICATIONS

Maximum Torque	17,000 ft.lbs./23,049 Nm
Maximum Operation Pressure	3,000 psi/207 Bar
RPM @ 35 GPM/133 LPM: Manual Gearbox **Max Allowable Flow Rate: 40 GPM/151 LPM** **(Using Standard A-20 Valve Package)** **Max Allowable Flow Rate: 60 GPM/227 LPM** **(Using Optional A-35 Valve Package)** **High** **Low**	 58 12
5 1/2" H.T. Tong Handle Length	24 1/2"/62.2 cm
5 1/2" LOCKJAW™ DP Backup Handle Length	28"/71.1 cm
Overall Length 5 1/2" HT Tong & 5 1/2" LJ DP Backup	49 5/8"/126.1 cm
Overall Width w/ Handles **Overall Width w/o Handles / HT Tong & LJ DP Backup**	30 1/4"/76.8 cm 28 3/4"/73.0 cm
Overall Height w/ LJ DP Backup	51"/129.5 cm
Overall Height w/ LJ DP Backup & Lifting Bracket	63 1/2"/161.3 cm
Weight Tong (approximate) **Weight 5 1/2" LOCKJAW™ DP Backup (approximate)** **Bottom Hanger (approximate)** **Tong Legs (approximate)** **Combined Weight Tong w/ 5 1/2" LJ DP Backup w/ Hanger & Legs (approximate)**	900 lbs./408.2 kg 875 lbs./398.0 kg 225 lbs./102.1 kg 50 lbs./ 22.7 kg 2,050 lbs./929.9 kg
Tong Jaw Options	2 1/16" thru 3 1/2" 3 1/2" thru 5 1/2"
1 BUCD5500 Backup Jaw Size	2 1/16" thru 5 1/2"
Gripping Range for Dovetail Tong Jaws (under nominal jaw or adapter sizes)	3/8" / 1.5 cm undersize
Gripping Range for LOCKJAW™ DP Backup dressed with Dovetail Adapters	1/4" / 0.6 cm undersize

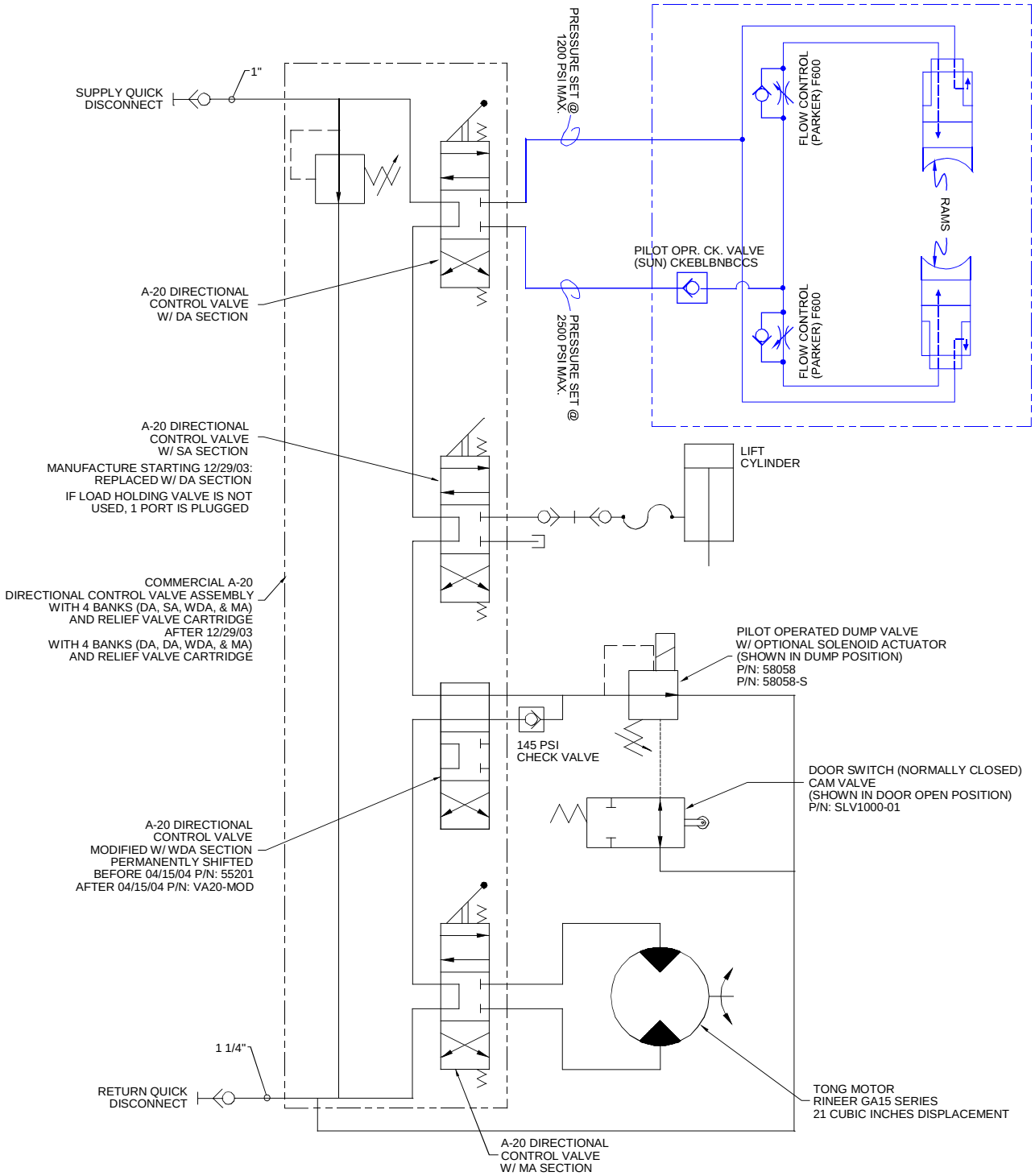
Operates using Steel Tooth Wrap Around Dies, **GRIT FACE™** Wrap Around Dies, and Aluminum Wrap Around Dies.

Standard Equipment:
- Door Interlock
- Self Adjusting Brake
- Tong Handles

Optional Equipment:
- Two Speed Hydraulic Motor
- Hydraulic Cage Plate Brake System
- Hydraulic Intensifier for Backup
- Varying Outlets for Torque Turns Computer Sending Units
- 3 Point Lifting Bridle
- Electronic Solenoid DumpValve
- Shipping Stand, or Skid

CLES5500HT TONG **BUC6375 SHT BACKUP**

SPECIAL NOTE: IF VALVE SECTION "COMMERCIAL SHEARING" DA-53 IS TO BE SUBSTITUTED, CYLINDER SPOOL MUST BE USED.


SUPPLY QUICK DISCONNECT
1"
PRESSURE SET @ 1200 PSI MAX.
FLOW CONTROL (PARKER) F600
RAMS
PILOT OPR. CK. VALVE (SUN) CKEBLBNBCCS
A-20 DIRECTIONAL CONTROL VALVE W/ DA SECTION
PRESSURE SET @ 2500 PSI MAX.
FLOW CONTROL (PARKER) F600
A-20 DIRECTIONAL CONTROL VALVE W/ SA SECTION
MANUFACTURE STARTING 12/29/03: REPLACED W/ DA SECTION
IF LOAD HOLDING VALVE IS NOT USED, 1 PORT IS PLUGGED
LIFT CYLINDER
COMMERCIAL A-20 DIRECTIONAL CONTROL VALVE ASSEMBLY WITH 4 BANKS (DA, SA, WDA, & MA) AND RELIEF VALVE CARTRIDGE AFTER 12/29/03 WITH 4 BANKS (DA, DA, WDA, & MA) AND RELIEF VALVE CARTRIDGE
PILOT OPERATED DUMP VALVE W/ OPTIONAL SOLENOID ACTUATOR (SHOWN IN DUMP POSITION) P/N: 58058 P/N: 58058-S
145 PSI CHECK VALVE
DOOR SWITCH (NORMALLY CLOSED) CAM VALVE (SHOWN IN DOOR OPEN POSITION) P/N: SLV1000-01
A-20 DIRECTIONAL CONTROL VALVE MODIFIED W/ WDA SECTION PERMANENTLY SHIFTED BEFORE 04/15/04 P/N: 55201 AFTER 04/15/04 P/N: VA20-MOD
1 1/4"
RETURN QUICK DISCONNECT
TONG MOTOR RINEER GA15 SERIES 21 CUBIC INCHES DISPLACEMENT
A-20 DIRECTIONAL CONTROL VALVE W/ MA SECTION

BASIC HYDRAULIC SCHEMATIC

CLES5500HT TONG
BUC6375 SHT BACKUP

NOTE: NUMEROUS FITTINGS, HOSES, & NIPPLES ARE NOT ILLUSTRATED IN THIS SCHEMATIC

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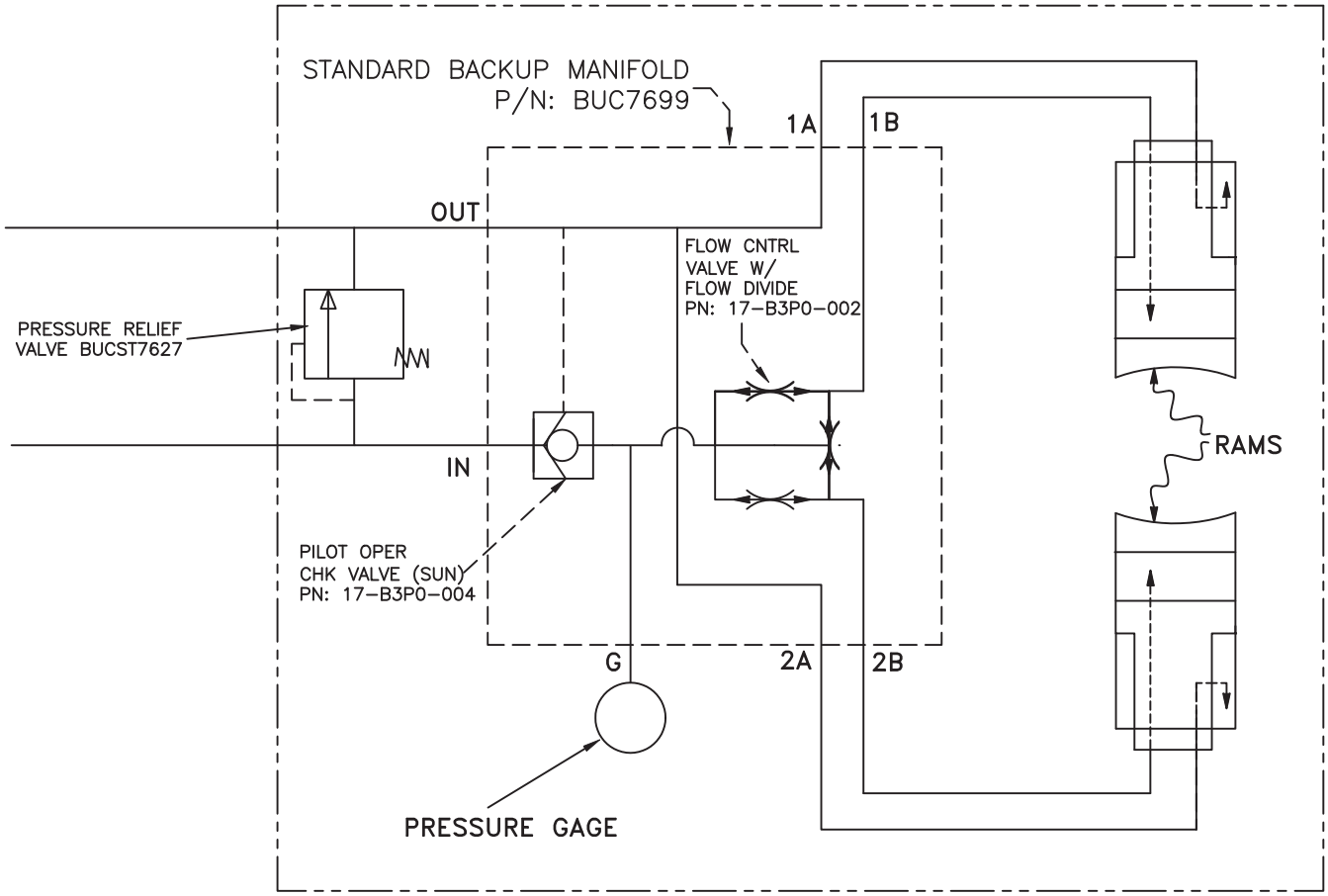

BASIC HYDRAULIC SCHEMATIC

BUCT6250-01 BACKUP (W/ MANIFOLD)

NOTE: NUMEROUS FITTINGS, HOSES, & NIPPLES
ARE NOT ILLUSTRATED IN THIS SCHEMATIC

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1		05/23/07

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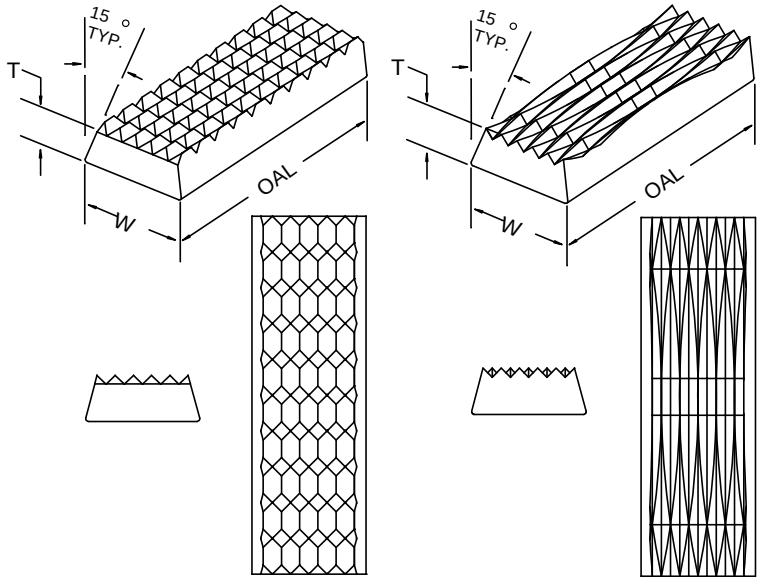
CLINCHER® DIES

Many **CLINCHER®** Tongs and Backups utilize jaws and/or adapters which accept Dovetail Inserts (AKA Pencil Dies or Strip Dies) to effectively grip tubulars. Jaw systems and jaw adapters are also available which accommodate Wrap-Around Fine Tooth Steel Dies, **GRIT FACE™** Dies and Aluminum Dies.

The appropriate jaws, die adapters and dies required for a specific tubular OD are also described in this section of the manual.



STRAIGHT TOOTH **DIAMOND TOOTH**

Note: Diamond Tooth Dies are used when a more aggressive bite is required.

Thickness	Width	OAL	P/N Straight Tooth	P/N Diamond Tooth
5/16	5/8	3 1/2	*	*
5/16	5/8	3 7/8	DTI4052	*
5/16	5/8	4 1/2	DTI4002	*
3/8	5/8	3 1/2	DTI4030	*
3/8	5/8	3 7/8	DTI4051	*
3/8	5/8	4 1/2	DTI4001	*

Thickness	Width	OAL	P/N Straight Tooth	P/N Diamond Tooth
17/32	5/8	3 1/2	DTI4031	*
17/32	5/8	3 7/8	DTI4053	*
17/32	5/8	4 1/2	DTI4003	*
5/8	5/8	3 1/2	DTI4032	*
5/8	5/8	3 7/8	DTI4054	*
5/8	5/8	4 1/2	DTI4004	*
11/16	5/8	3 7/8	DTI4055	*
11/16	5/8	4 1/2	DTI4005	*
3/8	1	3 7/8	DTI1505	*
3/8	1 1/4	3 7/8	DTI1614	*
3/8	1 1/4	5	DTI1610	*
7/16	1 1/4	3 7/8	DTI1612	DTI1612D
7/16	1 1/4	5	DTI1617	DTI1617D
1/2	1 1/4	3 7/8	DTI1601	DTI1601D
1/2	1 1/4	5	DTI1602	DTI1602D
9/16	1 1/4	3 7/8	DTI1622	DTI1622D
9/16	1 1/4	5	DTI1623	DTI1623D
5/8	1 1/4	3 7/8	DTI1632	DTI1632D
5/8	1 1/4	5	DTI1633	*
11/16	1 1/4	3 7/8	DTI1642	*
11/16	1 1/4	5	DTI1646	*
3/4	1 1/4	3 7/8	DTI1651	*
3/4	1 1/4	5	DTI1693	*
3/4	1 1/4	5 7/8	DTI1662	DTI1662D
13/16	1 1/4	3 7/8	DTI1661	*
13/16	1 1/4	5	DTI1664	*
7/8	1 1/4	3 7/8	DTI1671	*
7/8	1 1/4	5	DTI1673	*
1	1 1/4	3 7/8	DTI1691	*
1	1 1/4	5	DTI1697	*

* Available upon request.

CLINCHER® WRAP AROUND DIES

CLINCHER® Wrap Around Dies are available in three types:

Fine Toothed Steel Dies:	for low to ultra high torque applications on carbon steel tubulars including tubing, casing, and drill pipe
Smooth Faced Aluminum Dies:	for low to moderate torque applications on fiberglass and corrosion resistant alloy (stainless steel) tubulars
GRIT FACE™ Dies:	for low to high torque applications on fiberglass and corrosion resistant alloy (stainless steel) tubulars where the use of steel dies is prohibited as well as on carbon steel tubulars where reduced marking is desired

CLINCHER® Dies are designed to match the OD of the tubing, casing, coupling, or accessory being made up or broken out. Each die is stamped on the top or side to identify its size. Using Fine Toothed Steel Dies which are slightly larger than the tubular is acceptable provided the difference in diameters is less than 3/32" (0.093"). Aluminum and **GRIT FACE™** Dies should be matched with the specific tubular diameters required. **Note:** The use of improperly sized dies can result in reduced torque capacity, increased pipe marking, and reduced die life.

CAUTION: Do not attempt to grip tubular diameters which are larger than the dies being used. Failure to observe this precaution can result in damage to the tubular or tong jaws.

In emergencies where correct die sizes are unavailable, some operators have successfully used two different sizes of dies to accommodate unusual, nonstandard diameters.

CLINCHER® Wrap Around Dies are manufactured in specific diameters to match standard tubing and casing diameters, API coupling diameters, selected work string connection diameters and certain commonly used premium connection coupling diameters. **CLINCHER®** Wrap Around Dies should not be used on tubulars which are larger than the nominal die size. Steel Toothed Dies can be used on tubulars which are no smaller than 3/32" (0.093") less than the nominal die size. Aluminum and **GRIT FACE™** Dies should be matched with the specific tubular diameters required.

Note: Fine Toothed Steel Dies are normally stocked in our Broussard, Louisiana facility. Aluminum and **GRIT FACE™** Dies are normally made to order although a limited range of sizes and small quantities may be available from stock. Contact SUPERIOR Manufacturing & Hydraulics for information concerning availability of stock and special die sizes.

BUCD5500 5 1/2" LOCKJAW™ BACKUP FOR DRILL PIPE

The BUCD5500 **LOCKJAW™** Backup is a dual purpose tool intended for use on drill pipe and OCTG tubular goods. This operational flexibility is achieved through a combination of a "long stroke" rear clamping cylinder, compensating front jaws and dovetail die adapters or wrap around dies.

When used in the drill pipe mode with pipe larger than 5 1/4" OD up to 5 1/2" OD, wrap around dies must be used. The maximum dovetail die adapter can be as large as 5 1/4" in diameter. When used with dovetail die adapters and strip dies, the BUCD5500 can be used on tool joints which are as much as 1/4" smaller than the nominal size of the dovetail die adapter. The dovetail die adapters have been specially modified to insure adequate clearance exists between the die adapter in the clamping cylinder and the die adapter in the front jaws even when the "long stroke" capability of the clamping cylinder is extended to clamp on undersized pipe. The compensating front jaws are spring loaded and capable of moving to insure proper contact with undersized tool joints when dovetail die adapters are used. Note: Wrap around dies are not intended for use with undersized tubulars. The dovetail die adapters used with the BUCD5500 **LOCKJAW™** Backup for Drill Pipe can be readily identified by their part number:

BUDT55-XXXX where XXXX equals the nominal size
For example, if XXXX is 0500 this adapter is set up for 5.00" OD tool joints.

The splines used to hold the dovetail die adapter in the jaw is the same diameter as the splines used on BUC5500 **CLINCHER®** 5 1/2" UHT Backups and Dies. However, the dovetail die adapters used with the BUCD5500 **LOCKJAW™** Backup for Drill Pipe have 15 teeth on their OD compared to the 17 teeth on the OD of the BUC5500 UHT dies.

DIE INSTALLATION PROCEDURES (REFER TO ILLUSTRATION)

The "long stroke" cylinder in this tool must **not** be fully extended when changing dies to avoid interference with dies in the compensating front jaws. The following procedures are recommended for changing dies. Slowly close BUCD5500 **LOCKJAW™** until jaws are fully latched but do not allow rear clamping cylinder to extend out anymore than is required to remove the top die retaining clip. Shut off power unit, bleed off all trapped pressures and disconnect supply and return hoses.

WARNING: Failure to shut off power unit, bleed off trapped pressure and disconnect supply and return hoses may expose personnel to moving parts which will cause serious injury or death.

CAUTION: Fully closing the LOCKJAW™ Backup without correct sized dies and tubulars in place will result in equipment damage.

BUCD5500 5 1/2" LOCKJAW™ BACKUP FOR DRILL PIPE

When installing BUDT55-XXXX dovetail die adapters and BUC5500-XXXX wrap around dies it is critical the dies or die adapters used in the front compensating jaws be installed so that their front edge is flush with the edge of the compensating jaw closest to the "**LOCKJAW™** door hooks". The back edge of the dovetail die adapter will line up with the edge of the compensating jaw furthest away from the "**LOCKJAW™** door hooks". When wrap around dies are installed, the back edge of the die will extend beyond the edge of the compensating jaw which is furthest away from the "**LOCKJAW™** door hooks". The difference between these two die systems is the clearance required when the dovetail die adapter is used with undersized tool joints.

Remove upper clip bolts, upper clip and die from rear clamping jaw. Install appropriate wrap around die or dovetail die adapter. Rear die should be centered in rear jaw. Reinstall upper clip and clip bolts. Lubricate clip bolts with Never-Seez or equivalent. Tighten bolts securely to approximately 38 ft lbs.

Remove upper clip bolts, upper clips and dies from compensating front jaws. Install appropriate wrap around die or dovetail die adapter. Reinstall upper clips and clip bolts. Lubricate clip bolts with Never-Seez or equivalent. Tighten bolts securely to approximately 38 ft lbs.

Reconnect supply and return hoses. Restart power unit. Fully open backup and tubular with OD compatible with dies. Close backup and clamp on pipe. Visually confirm door is fully closed and locked and that all dies are gripping uniformly.

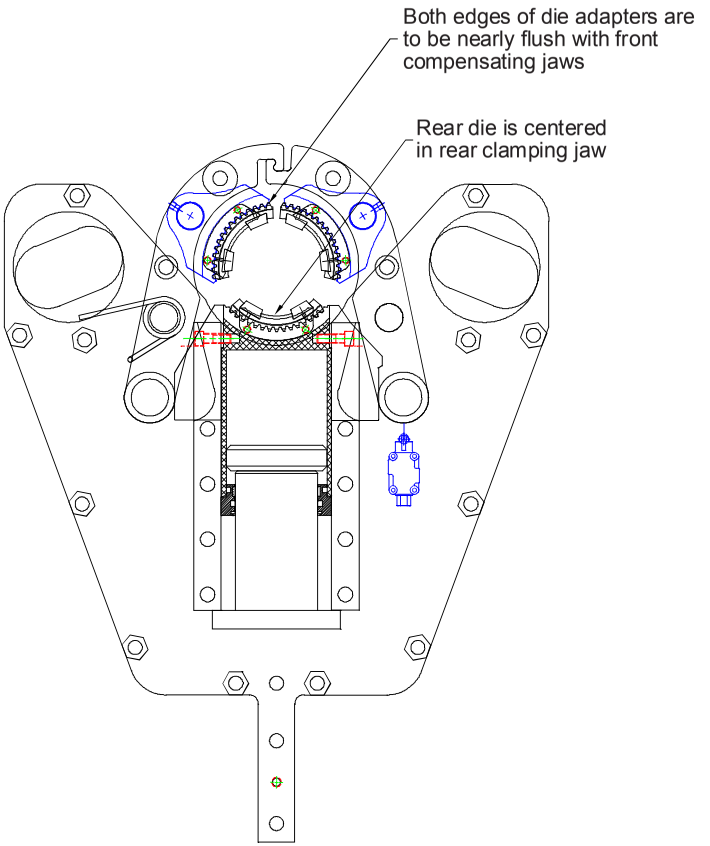
DIES, DIE RETAINERS AND DIE RETAINER CLIPS

The BUCD5500 **LOCKJAW™** Backup for Drill Pipe is a versatile tool which can be used on drill pipe and OCTG tubular goods. It accepts dovetail die adapters (BUDT55-XXXX 2 3/8" thru 5 1/4") (BUCX55005500 5 1/2") described above, wrap around fine tooth steel dies (BUC5500-XXXX), wrap around **GRIT FACE™** dies (BB5700-XXXX) or wrap around aluminum dies (BUCA5500-XXXX).

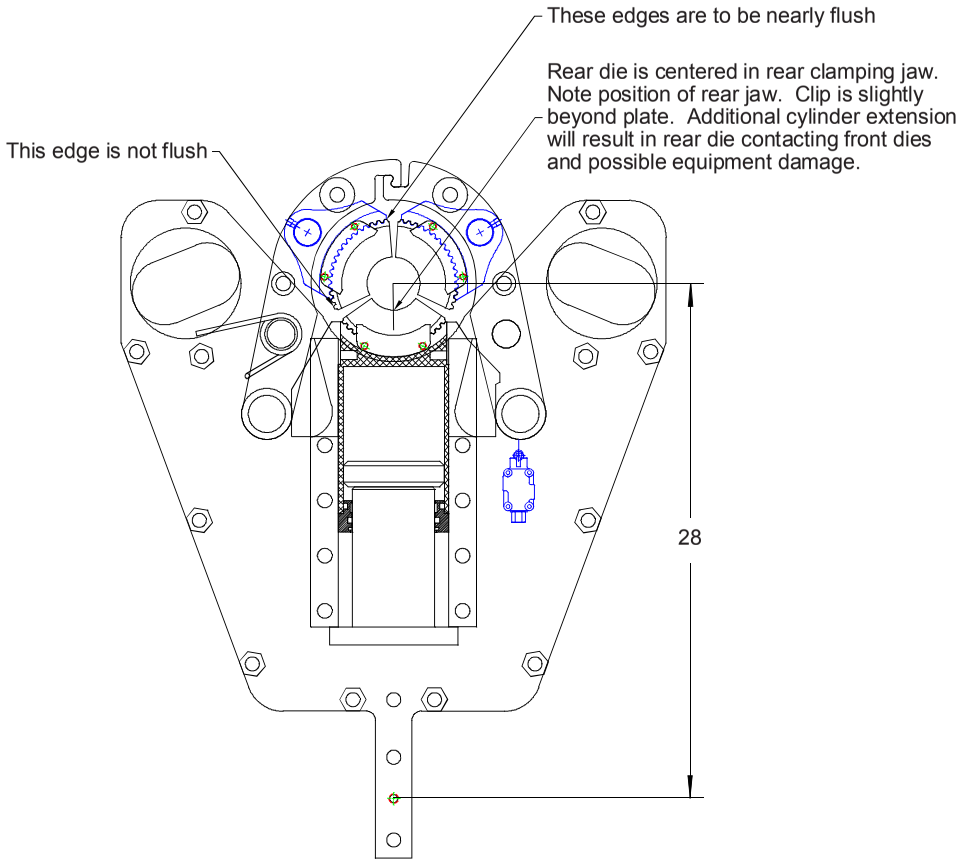
Special consideration must be given to insure the proper clips are used to insure proper die retention. The difference between the clips is the minor diameter and the thickness of the retaining lip. The BUCD5514 has an inner radius of 2.865" and a lip thickness of 0.200". The BUCD5531 has an inner radius of 2.780" and a lip thickness of 0.285".

Die or Die Adapter Series	Lower Clip Part Number	Upper Clip Part Number
wrap around dies 5 1/2" to 5"	BUCD5514	BUCD5514
all wrap around dies smaller than 5"	BUCD5514 or BUCD5531	BUCD5514 or BUCD5531
dovetail die adapters 5 1/4"	BUCD5514	BUCD5514
dovetail die adapters 5 1/4 " to 4 3/4"	BUCD5514 or BUCD5531	BUCD5531
all dovetail die adapters smaller than 4 3/4"	BUCD5514 or BUCD5531	BUCD5514 or BUCD5531

BUCD5500 **CLINCHER®** 5 1/2" **LOCKJAW™** Backup dressed with dovetail die adapters and strip dies for 4 3/4" drillpipe



BUCD5500 **CLINCHER®** 5 1/2" **LOCKJAW™** Backup dressed with wrap around dies for 2 7/8" tubing


These edges are to be nearly flush
Rear die is centered in rear clamping jaw. Note position of rear jaw. Clip is slightly beyond plate. Additional cylinder extension will result in rear die contacting front dies and possible equipment damage.
This edge is not flush
28

Rev.#	By	Log#	Description of Revision
6			
5			
4			
3			
2			
1			

1/8 LS STAMP P/N & W.O ON NON-CRITICAL SURFACE

ETCH P/N & W.O ON NON-CRITICAL SURFACE

TAG P/N & W.O

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE — R6

2 PLACE DEC.	3 PLACE DEC.	FRACTIONS	ANGLES	SURFACE	FLATNESS AR PL.
±.020	±.005	± 1/16	± .5°	250	± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

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1 =Revision No. X =STAMP,ETCH,TAG =Machine Zero

1.000 = Critical Dimension 100% Inspection Required

SHEET 1 of 1

SUPERIOR Manufacturing & Hydraulics
4225 HWY.90 E
BROUSSARD,LA 70518
(318)837-8847

PART NAME: use of die adapters and dies in BUCD5500 **LOCKJAW™** Backup

PART #:illustration

DRAWN BY:

APPROVED BY: DAN B

CHK BY: DB DATE: 11/22/99

REF: F:\Mark\BUCD5500\assembly.DWG

MATERIAL SPECIFICATION

Matl.Req:

Initial Condition:

Alternate Matl:

H.T Instructions: Case Depth:

P:\Manuals\Equip Manuals\Dwgs\BUCD5500 Die Adapter Illustration rev1.wpg 05/18/07

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Gripping range, adapters and dovetail die inserts for CLINCHER® 5 1/2 LOCKJAW™ Backup for Drillpipe

Nominal Dovetail Tong Jaw and Dovetail Die Adapter Size	backup dovetail die adapter part number	nominal dovetail jaw & adapter size	Dovetail tong jaw and dovetail backup adapter diametrical gripping range (OD in inches) when dressed with1 1/4" wide 3 7/8" long dovetail strip dies with thickness of:									
			1	0.875	0.8125	0.75	0.6875	0.625	0.5625	**0.5**	0.4375	<<dovetail die thickness
	3 dovetail die adapters required to dress backup		*undersized (use this size for emergencies only)*	*undersized (use this size for emergencies only)*	*undersized (use this size for emergencies only)*	*undersized*	*undersized*	*undersized*	*undersized*	***STANDARD***	*oversized (use this size for emergencies only)*	<<pipe application
5 1/2 x 2 7/8	BUDT55-02875	2.875	1.875	2.125	2.250	2.375	2.500	2.625	2.750	**2.875**	3.000	maximum pipe OD for die & jaw
			1.625	*1.875*	*2.000*	*2.125*	*2.250*	*2.375*	*2.500*	***2.625***	*2.750*	*minimum undersized condition*
5 1/2 x 3 1/8	BUDT55-03125	3.125	2.125	2.375	2.500	2.625	2.750	2.875	3.000	**3.125**	3.250	maximum pipe OD for die & jaw
			1.875	*2.125*	*2.250*	*2.375*	*2.500*	*2.625*	*2.750*	***2.875***	*3.000*	*minimum undersized condition*
5 1/2 x 3 3/8	BUDT55-03375	3.375	2.375	2.625	2.750	2.875	3.000	3.125	3.250	**3.375**	3.500	maximum pipe OD for die & jaw
			2.125	*2.375*	*2.500*	*2.625*	*2.750*	*2.875*	*3.000*	***3.125***	*3.250*	*minimum undersized condition*
5 1/2 x 3 1/2	BUDT55-03500	3.500	2.500	2.750	2.875	3.000	3.125	3.250	3.375	**3.500**	3.625	maximum pipe OD for die & jaw
			2.250	*2.500*	*2.625*	*2.750*	*2.875*	*3.000*	*3.125*	***3.250***	*3.375*	*minimum undersized condition*
5 1/2 x 4	BUDT55-04000	4.000	3.000	3.250	3.375	3.500	3.625	3.750	3.875	**4.000**	4.125	maximum pipe OD for die & jaw
			2.750	*3.000*	*3.125*	*3.250*	*3.375*	*3.500*	*3.625*	***3.750***	*3.875*	*minimum undersized condition*
5 1/2 x 4 1/8	BUDT55-04125	4.125	3.125	3.375	3.500	3.625	3.750	3.875	4.000	**4.125**	4.250	maximum pipe OD for die & jaw
			2.875	*3.125*	*3.250*	*3.375*	*3.500*	*3.625*	*3.750*	***3.875***	*4.000*	*minimum undersized condition*
5 1/2 x 4 1/4	BUDT55-04250	4.250	3.250	3.500	3.625	3.750	3.875	4.000	4.125	**4.250**	4.375	maximum pipe OD for die & jaw
			3.000	*3.250*	*3.375*	*3.500*	*3.625*	*3.750*	*3.875*	***4.000***	*4.125*	*minimum undersized condition*
5 1/2 x 4 1/2	BUDT55-04500	4.500	3.500	3.750	3.875	4.000	4.125	4.250	4.375	**4.500**	4.625	maximum pipe OD for die & jaw
			3.250	*3.500*	*3.625*	*3.750*	*3.875*	*4.000*	*4.125*	***4.250***	*4.375*	*minimum undersized condition*
5 1/2 x 4 3/4	BUDT55-04750	4.750	3.750	4.000	4.125	4.250	4.375	4.500	4.625	**4.750**	4.875	maximum pipe OD for die & jaw
			3.500	*3.750*	*3.875*	*4.000*	*4.125*	*4.250*	*4.375*	***4.500***	*4.625*	*minimum undersized condition*
5 1/2 x 4 7/8	BUDT55-04875	4.875	3.875	4.125	4.250	4.375	4.500	4.625	4.750	**4.875**	5.000	maximum pipe OD for die & jaw
			3.625	*3.875*	*4.000*	*4.125*	*4.250*	*4.375*	*4.500*	***4.625***	*4.750*	*minimum undersized condition*
5 1/2 x 5	BUDT55-05000	5.000	4.000	4.250	4.375	4.500	4.625	4.750	4.875	**5.000**	5.125	maximum pipe OD for die & jaw
			3.750	*4.000*	*4.125*	*4.250*	*4.375*	*4.500*	*4.625*	***4.750***	*4.875*	*minimum undersized condition*
5 1/2 x 5 1/4	BUDT55-05250	5.250	4.250	4.500	4.625	4.750	4.875	5.000	5.125	**5.250**	5.375	maximum pipe OD for die & jaw
			4.000	*4.250*	*4.375*	*4.500*	*4.625*	*4.750*	*4.875*	***5.000***	*5.125*	*minimum undersized condition*
5 1/2 x 5 1/2	BUCX55005500	5.500	4.500	4.750	4.875	5.000	5.125	5.250	5.375	**5.500**	5.625	maximum pipe OD for die & jaw
			4.250	*4.500*	*4.625*	*4.750*	*4.875*	*5.000*	*5.125*	***5.250***	*5.375*	*minimum undersized condition*
Note: XXXXX indicates this size has not been designed at this time, but is available upon request.												
*REPLACEMENT DOVETAIL INSERTS for JAWS AND DIE ADAPTERS - **CLINCHER**® part number for 1 1/4" wide x 3 7/8" long straight toothed dovetail die inserts used in dovetail jaws (4 pcs required per jaw or 8 pcs required per jaw set and dovetail die adapters (4 pcs)*			DTI1691	DTI1671	DTI1661	DTI1651	DTI1642	DTI1632	DTI1622	**DTI1601**	DTI1612	
*REPLACEMENT DOVETAIL INSERTS for JAWS AND DIE ADAPTERS - **CLINCHER**® part number for 1 1/4" wide x 3 7/8" long diamond toothed dovetail die inserts used in dovetail jaws (4 pcs required per jaw or 8 pcs required per jaw set and dovetail die adapters (4 pcs)*			upon request	upon request	upon request	upon request	upon request	DTI1632D	DTI1622D	**DTI1601D**	DTI1612D	

Wrap Around Dies for BUC5500 5 1/2 UHT Backup and BUCD5500 5 1/2 LOCKJAW™ DP Backup for tubing and casing

fine tooth steel dies for backup	**GRIT FACE™** dies for backup	non-marking aluminum dies for backup
BUC5500-nnnnn	BB5700-nnnnn	BUCA5500-nnnnn
BUC5500-nnnnn	BB5700-nnnnn	BUCA5500-nnnnn
BUC5500-nnnnn	BB5700-nnnnn	BUCA5500-nnnnn

-nnnnn indicates size designated by replacing "nnnnn" sequence with size required (in inches) to three decimal places; i.e., 4.500 for 4 1/2" OD casing.

Note: **CLINCHER®** wraparound dies are machined to specific casing, tubing, coupling or accessory diameter. Additional dies must be orderd to match specific coupling diameters associated with accessories or special clearance premium tubular connections.

ASSEMBLY INSTRUCTIONS

FASTENER LUBRICATION AND MAKE UP TORQUE REQUIREMENTS

Most bolts, nuts, and other threaded components are to be lubricated with Never-Seez or equivalent before assembly. Certain fasteners are to be assembled using permanent or removable Loctite as indicated in the assembly instructions. All tapered pipe threads are to be treated with a Teflon based pipe dope to assist in makeup and prevent leakage.

CAUTION: Do not use teflon tape. Improper application of teflon tape can cause joint failures. Teflon tape can release large particles which can plug small passages in hydraulic equipment.

All standard fasteners used in **CLINCHER®** products are to be GRADE 8 or better. DO NOT SUBSTITUTE lesser grades of fasteners. All fasteners are to be made up to the torque charted below. Failure to properly assemble these fasteners can result in their loss, product malfunction, and ultimately result in situations where personnel can be exposed to dangerous situations.

TONG FASTENERS		
Size	***Application***	***Torque***
1/4 - 20 NC	door switch mounting bolts, backup clip bolts	10 ft lbs
3/8 - 16 Set Screws	bearing caps, door switch adj. sleeve	* [1]
3/8 - 16 NC	top & bottom tong plates, door plates, brake bands, brake guards, front followers, clip bolts	33 ft lbs
1/2 - 13 NC	motor mounts, cage plate spacer bolts, bearing caps, backup jaw bolts	93 ft lbs
5/8 - 18 NF	cam follower nuts	27 ft lbs
3/4 - 10 NC	hanger bolts	317 ft lbs
7/8 - 14 NF	dumbell roller shaft, door shaft	* [2]
1 1/4 - 12 NF	idler shaft	850 ft lbs

* [1] Bearing Caps: Coat with removable Loctite, tighten until screw contacts bearing, back off 1 turn. Door Switch Adj. Sleeve: Tighten by hand until snug.

* [2] Tighten until all slack is removed, but dumbell roller is still free to rotate by hand.

LUBRICATION STANDARDS

Bearings and gears must be lubricated to minimize friction, cool, exclude foreign matter, and prevent corrosion. **CLINCHER®** recommends using Texaco Marfak MP 2 or equivalent for all grease zerts, roller bearings, and bushings. Gears located within the clutch housing or between the tong plates are to be heavily lubricated using PLUSCO 855 or equivalent.

TONG ASSEMBLY INSTRUCTIONS

This section pertains to the physical assembly of the **CLINCHER®** CLES5500HT High Torque Tong. Section 9 illustrates the individual sub assemblies in more detail. The purpose of this section is to guide the technician in the order of assembly as we would accomplish in the manufacturing process at our plant. Use this section as a guide to help you familiarize yourself with the component parts of the CLES5500HT. We have included drawings on the following pages to aid in the assembly. The drawings are laid out in the order in which you would assemble/disassemble the unit.

Order of Assembly:

1. Locate suitable working height. Approximately 6" above your waist. Tong Assembly Stands are available from Superior Manufacturing & Hydraulics, Inc. which are custom made for tong service work.
2. Install Bottom Tong Plate PN 51046A, on Assembly Stand.
3. Bolt Tong Mid Body PN 51047A to Bottom Tong Plate PN 51046A, with (21) 3/8"-16 x 1 3/4" Bolt PN 1049, (21) 3/8" Lockwasher PN 1027, and (2) 3/8"-16 x 1" SHCS PN 1041 and (2) 3/8" Hi Collar Lockwasher PN 1026.
4. Install 1/8" NPT Zert PN 1001 into Bottom Pinion Bearing Cap PN 51070. Press Bearing PN 1907 into Bottom Pinion Bearing Cap.
5. Install Bottom Pinion Bearing Cap Assembly onto Bottom Tong Plate PN 51046A using (3) 1/2"-13 x 1-1/4" Bolt PN 1111 with (3) 1/2" Lockwasher PN 1103, and (2) 3/8"-16 x 1/2" Set Screws PN 1029 (use removable Loctite).
6. Dumbell Roller Assembly:
   a) Install 1/8" NPT Zert PN 1001 on Dumbell Roller Shaft PN 45031.
   b) Install 7/8"-14 Jam Nut PN 1178 onto Dumbell Roller Shaft PN 45031, making certain that it is installed on the end which has the grease port. Tack weld nut to dumbell roller shaft.
   c) Press Dumbell Roller Bushing (Bearing) PN 45055 into each end of Dumbell Roller PN 45032.
   d) Install (2) Thrust Washer PN 45057 onto each end of Dumbell Roller Assembly.
   e) Install (3) Bushing PN 1955 onto Dumbell Roller Shaft PN 45031.
   f) Make up (1) 7/8"-14 Nylock Nut PN 1177 on other end of each Dumbell Shaft PN 45031.
7. Idler Gear Assembly: *(2 Units Required)*
   a) Press Bearing PN 1908 into Idler Gear PN 51095.
   b) Install (2) Internal Snap Rings PN 1937 in Idler Gear PN 51095.
   c) Press Idler Gear Assembly onto Idler Shaft PN 45096.
   d) Install Idler Spacer PN 45097 onto Shaft.
   e) Install large end of Shaft Assembly and Idler Gear Assembly into Bottom Tong Plate PN 51046A and Idler Pad PN 45018 using 1 1/4"-12 Nut PN 1215 with 1 1/4" Lockwasher PN 1216.
8. Install Ring Gear PN 56001 into Tong Body making sure teeth in Idler Gears align with teeth in Ring Gear.
9. Install (9) Dumbell Roller Assemblies around Ring Gear PN 56001 making sure holes in Dumbell Roller Assemblies match up to holes in Bottom Tong Plate PN 51046A.
   Hint: Temporarily install Dumbell Roller Shafts thru Dumbell Roller Assembly and Bottom Tong Plate to control position.

TONG ASSEMBLY INSTRUCTIONS

10. Pinion Gear Assembly:
    a) Install High Gear PN 45101 onto Pinion Gear 45100-01 then press Pinion Gear into Bearing PN 1907 which was previously installed in Bottom Pinion Bearing Cap PN 51070 attached to Bottom Tong Plate.
    b) Install Low Pinion Gear PN 51099 onto Pinion Gear PN 45100-01.
11. Install Top Tong Plate PN 51067A onto Mid Body PN 51047A with (21) 3/8"-16 x 1 3/4" Bolts PN 1049, (21) 3/8" Lockwashers PN 1027, (2) 3/8"-16 x 1" SHCS PN 1041, and (2) 3/8" Hi Collar Lockwashers PN 1026.
12. Press Bearing PN 1907 into Top Pinion Bearing Cap PN 51070-04. Install Top Pinion Bearing Cap Assembly onto Pinion Gear PN 45100-01. Bolt to Top Tong Plate PN 51067A using (3) 1/2"-13 x 1 1/4" Bolt PN 1111 with (3) 1/2" Lockwasher PN 1103 and (2) 3/8"-16 x 1/2" Set Screw PN 1029 (use Removable Loctite).
    Note: When Encoder is not mounted, install Flush Plug PN 1610 on Bearing Cap PN 51070-04. For optional Encoder mounting, see figure of Pinion Gear with Encoder.
13. Insert Dumbell Roller Shafts PN 45031 with 7/8"-14 Jam Nut PN 1178 through Bottom Tong Plate PN 51046A, through Dumbell Roller Assemblies, and finally through Top Tong Plate PN 51067A. After installing Dumbell Roller Shafts through Top Tong Plate, fasten with 7/8"-14 Nylock Nut PN 1177.
    WARNING: Insure Thrust Washers are correctly positioned.
14. Install Idler Pad PN 45018, 1 1/4" Lockwasher PN 1216 and 1 1/4"-12 Nut PN 1215 onto each Idler Shaft Assembly (2) outside of Top Tong Plate PN 51067A, then install 1/8" NPT Zerts PN 1001.
15. Motor Gear Assembly:
    a) Press Bearing PN 1907 into Bearing Housing PN 51038 and install Ext. Snap Ring PN 1945.
    b) Install Bearing Cap PN 51039 and Bearing Housing Assembly onto Bottom Tong Plate PN 51046A using (3) 1/2"-13 x 1 3/4" HHCS PN 171 with (3) 1/2" Lockwasher PN 1103.
    c) Install 1/8" NPT Flush Plug PN 1607 into Bearing Cap PN 51039.
    d) Install High Shifting Gear PN 45071 and Bushing PN 45071-S1 on Bottom Plate, on top of Bearing Housing.
16. Shifting Gear/Detent Assembly *(1st Generation)*:

    Install Drive Gear PN 51072 over Motor Shaft PN 52009. Install Steel Ball PN 1906 and Detent Spring PN A20-A1327135 into Drive Gear PN 51072. Apply permanent Loctite to 3/8"-16 x 1/4" Set Screw PN 1028. Install Set Screw in Drive Gear PN 51072, tighten Set Screw until good detent action is achieved. Proper adjustment is confirmed when resistance is encountered when shifting gear across detent groove on shaft.

    Shifting Gear/Detent Assembly *(2nd Generation)*:

    Install Drive Gear PN 51072-01 over Motor Shaft PN 52009. Install (2) Spring Plunger PN 1311 into Drive Gear. Tighten Plungers until good detent action is achieved. Proper adjustment is confirmed when resistance is encountered when shifting gear across detent groove on shaft.

TONG ASSEMBLY INSTRUCTIONS

17. Install Drive Gear PN 51072 with Shifting Shaft Assembly PN 45060, Shifting Yoke Assembly PN 45061 in Clutch Housing Assembly PN 51067-S3, using Washer PN 45068 and 3/16" x 1" Roll Pin PN 1006.

    See Shifting Box Assembly Illustration 2nd Generation for components of Shift Assembly PN 45091.

18. Install Polypack Seal PN 12501375 and Motor Seal PN MCN-1377 into Seal Retainer PN 45077-A. Install Seal Retainer Assembly and Motor Shaft Spacer PN 45076 onto Motor Shaft PN 52009. Install Motor PN 58072 with Motor Shaft Assembly in Clutch Housing using (4) 1/2"-13 x 1" Bolt PN 1110 and (4) 1/2" Lockwasher PN 1103.

19. Install A-20 Valve Sections with plumbing on Motor PN 58072.

20. Cam Follower Assemblies:

    a) Install (13) Cam Followers PN 1965 in Top Cage Plate PN 51008 with (13) 3/16" Drive Zert PN 1004 and fasten with (13) 5/8"-18 Jam Nut PN 1150.

    b) Install (13) Cam Followers PN 1965 in Bottom Cage Plate PN 51033 with (13) 3/16" Drive Zert PN 1004 and fasten with (13) 5/8"-18 Jam Nut PN 1150.

    c) Fit Top Cage Plate Cam Followers into Ring Gear groove. Use crane to raise Bottom Cage Plate and fit Bottom Cage Plate Cam Followers into Ring Gear groove. Fasten Cage Plates together using (4) 1/2"-13 x 3 1/2" SHCS PN 1108.

21. A) Door Assembly and Door Installation: *(For Productions Before 11/2000)*

    1) Press Bushing PN 51036 in top and bottom of Tong Door Assembly PN 51035A.

    2) Install 7/8"-14 Jam Nut PN 1178 on Door Shaft PN 45054.

    3) Install Door Washer PN 45025 and Bottom Door Bushing PN 1955-B onto Door Shaft PN 45054.

    4) Install Tong Door Shaft Assembly through Bottom Door Plate, Bottom Tong Plate, Dumbell Roller Assembly, Top Tong Plate, Door Washer PN 41037, and Top Door Plate.

    5) Slide Top Door Bushing PN 1955-A and Door Washer PN 45025 onto Door Shaft Assembly.

    6) Install 7/8"-14 Nylock Nut PN 1177 and 1/8" NPT Zert PN 1001 onto Tong Door Shaft Assembly.

    7) Install Door Switch Adjustment Sleeve PN 76131 onto top of Door.
    Note: Collar is cut with weld bevel and is to be welded to top of Tong Door.

    8) Install (2) 3/8"-16 x 1/2" Set Screws PN 1029 (use removable Loctite) on Door Switch Adjustment Sleeve.

21. B) Integrated Door Assembly and Door Installation: *(For Productions After 11/2000)*

    1) Assemble Door Handle PN 51041 onto Top Door Plate PN 51043 using 1/2"-13 x 1 3/4" HHCS PN 171 with 1/2" Lockwasher PN 1103.

    2) Assemble Top Door Plate PN 51043 onto Tong Door Upright PN 51040 using (4) 3/8"-16 x 1 1/2" HHCS PN 1049 with (4) 3/8" Lockwasher PN 1027.

TONG ASSEMBLY INSTRUCTIONS

3) Assemble Bottom Door Plate PN 51037 onto Tong Door Upright PN 51040 using (4) 3/8"-16 x 1 1/2" HHCS PN 1049 with (4) 3/8" Lockwasher PN 1027.

4) Press Bushing PN 51036 in top and bottom of Tong Door Assembly PN 51035A.

5) Install 7/8"-14 Jam Nut PN 1178 on Door Shaft PN 45054.

6) Install Door Washer PN 45025 and Bottom Door Bushing PN 1955 onto Door Shaft PN 45054.

7) Install Tong Door Shaft Assembly through Bottom Door Plate, Bottom Tong Plate, Dumbell Roller Assembly, Top Tong Plate, Door Washer PN 41037, and Top Door Plate.

8) Slide Top Door Bushing PN 1955-A and Door Washer PN 45025 onto Door Shaft Assembly.

9) Install 7/8"-14 Nylock Nut PN 1177 and 1/8" NPT Zert PN 1001 onto Tong Door Shaft Assembly.

10) Install Door Switch Adjustment Sleeve PN 76131 onto top of Door.
Note: Collar is cut with weld bevel and is to be welded to top of Tong Door.

11) Install (2) 3/8"-16 x 1/2" Set Screws PN 1029 (use removable Loctite) on Door Switch Adjustment Sleeve.

22. Door Switch Assembly:

a) Install (1) 1/4" Street Ell PN 1449 in Door Switch PN SLV1000-01.

b) Install (1) 1/4" MNPT x 1/4" MJIC 90 Degree PN 1576.

c) Install (1) 1/4" MNPT x 1/4" MJIC 90 Degree PN 1576 into “tank” port of Door Switch PN SLV1000-01.

d) Mount Door Switch PN SLV1000-01 on Door Switch Base PN 76128 with (4) 1/4"-20 x 2 1/4" Bolt PN 110, and (4) 1/4"-20 Nylock Nut PN 212.

e) Mount Assembly to (2) Door Switch Base Mount PN 45067-S7 (Base Mounts should be welded to Top Tong Plate) with (2) 3/8"-16 x 1" Bolt PN 1047 and (2) 3/8" Lockwasher PN 1027.

23. Door Switch Adjustment Instructions:

a) Loosen 3/8"-16 x 1/2" Set Screws PN 1029 to align recess in Door Switch Adjustment Sleeve PN 76131 with Roller on Door Switch PN SLV1000-01. Tighten Set Screws PN 1029.

b) Loosen 1/4"-20 Nylock Nuts PN 212 and slide Door Switch PN SLV1000-01 forward until fully seated in recess in Door Switch Adjustment Sleeve PN 76131. Tighten Nylock Nuts PN 212.

c) Connect Tong to Power Unit and actuate motor while in low gear. Verify Ring Gear stops rotating when Tong Door is opened.

OPERATION

Suspension

A) Tong should be hung by minimum 7/8" 1 WRC minimum O.D. wire cable with a 31 ton minimum breaking strength. It should be hung as close to the center of the drill rotary without interfering with operation of drill string and lifting equipment. It is recommended the operator make use of the **CLINCHER®** Lift Cylinder. The **CLINCHER®** Lift Cylinder incorporates a hydraulic cylinder and manual lift spring. The hydraulic cylinder portion is used to assist in the raising and lowering of the tong and backup while the spring allows for movement during make-up and break-out.

WARNING: The suspension system must allow the tong to easily move down a distance equivalent to the thread make-up length. If significant resistance is encountered the suspension system may be subject to load which could cause its failure, damage equipment, or expose personnel to severe or fatal hazards.

B) Assure that the tong is suspended in level manner. Tong must be level at the point it contacts the tubular. Using adjustment screws and slots in rigid hanger assembly, adjust tong so that it hangs level on horizontal axis and is parallel to tubular on vertical axis. If using 3 point bridle, use turnbuckles to adjust tong so it hangs level.

C) Make certain that floor space is adequate to maneuver tong on and off pipe. The space must be clear of obstructions to allow safe and unrestricted operation.

D) Attach 3/4" IWRC minimum wire cable with a 29.4 ton minimum or better breaking strength, as a tong back up line at 90 degree angle to tong and at the same level to insure proper readout of torque indicator. You should always have snubbing line attached. Use of a integral hydraulic backup is safer than manual backup, but operators should maintain additional safety of snubbing line to prevent injury in case of hydraulic failure or the failure of operator to have backup properly applied to tubular. This equipment generates extreme torque and should be used with caution.

Jaw and Wrap Around Die Installation

A) Be sure all power to unit is off, and power unit is shut down. Disconnect hydraulic hoses.

B) Determine O.D. of tubular to be made-up or broken-out. Use proper dies to bite O.D. of tubular and insert as follows: Remove jaw assembly from tong. Remove upper die retainer clips. Insert die into jaw. Reinstall clips and clip retainer bolts. Reinstall jaws into cage plates, install pivot pins and reattach springs.

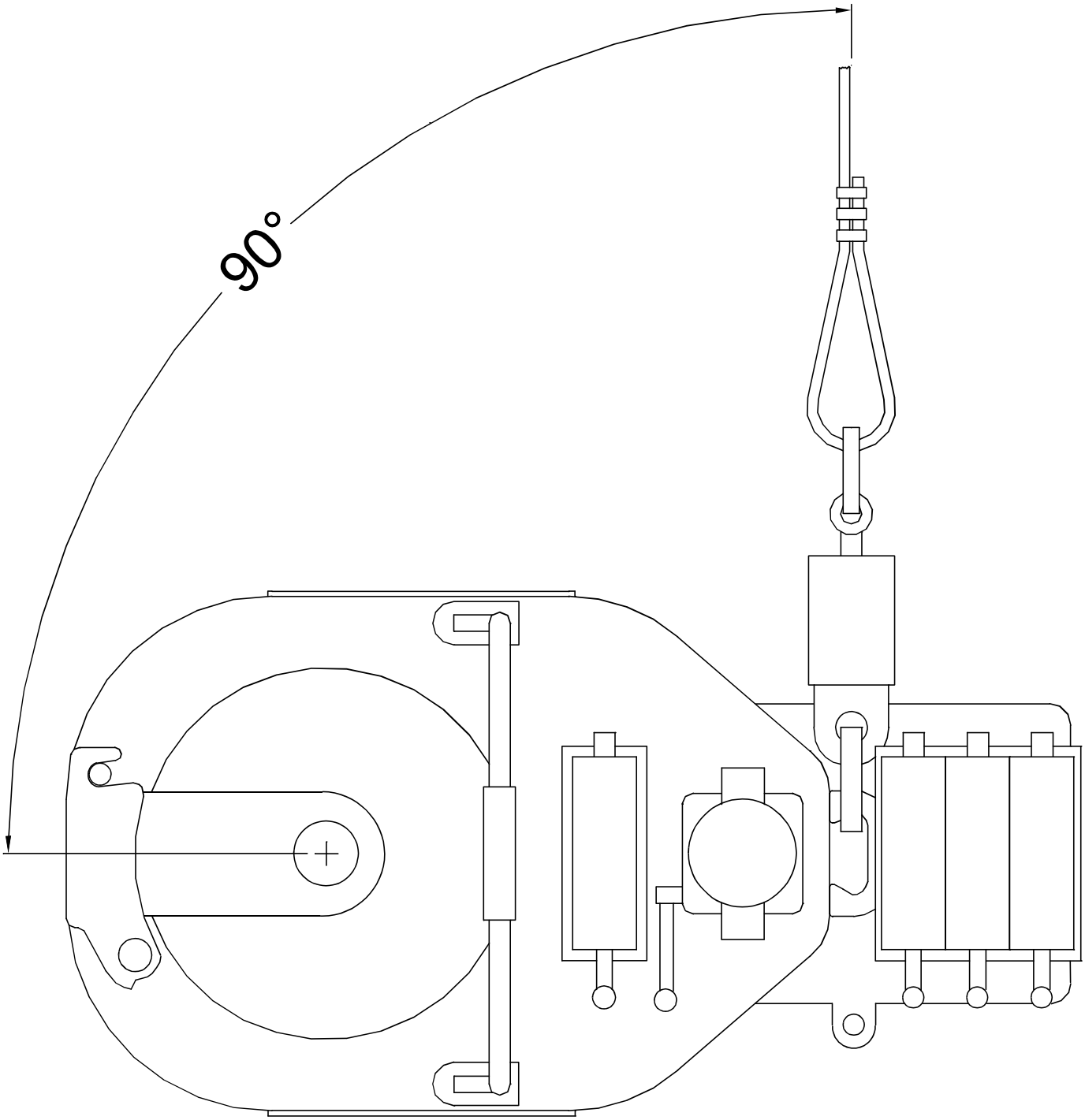
OPERATION

Hydraulic Lines

A) Be sure all power to unit is off, and power unit is shut down.

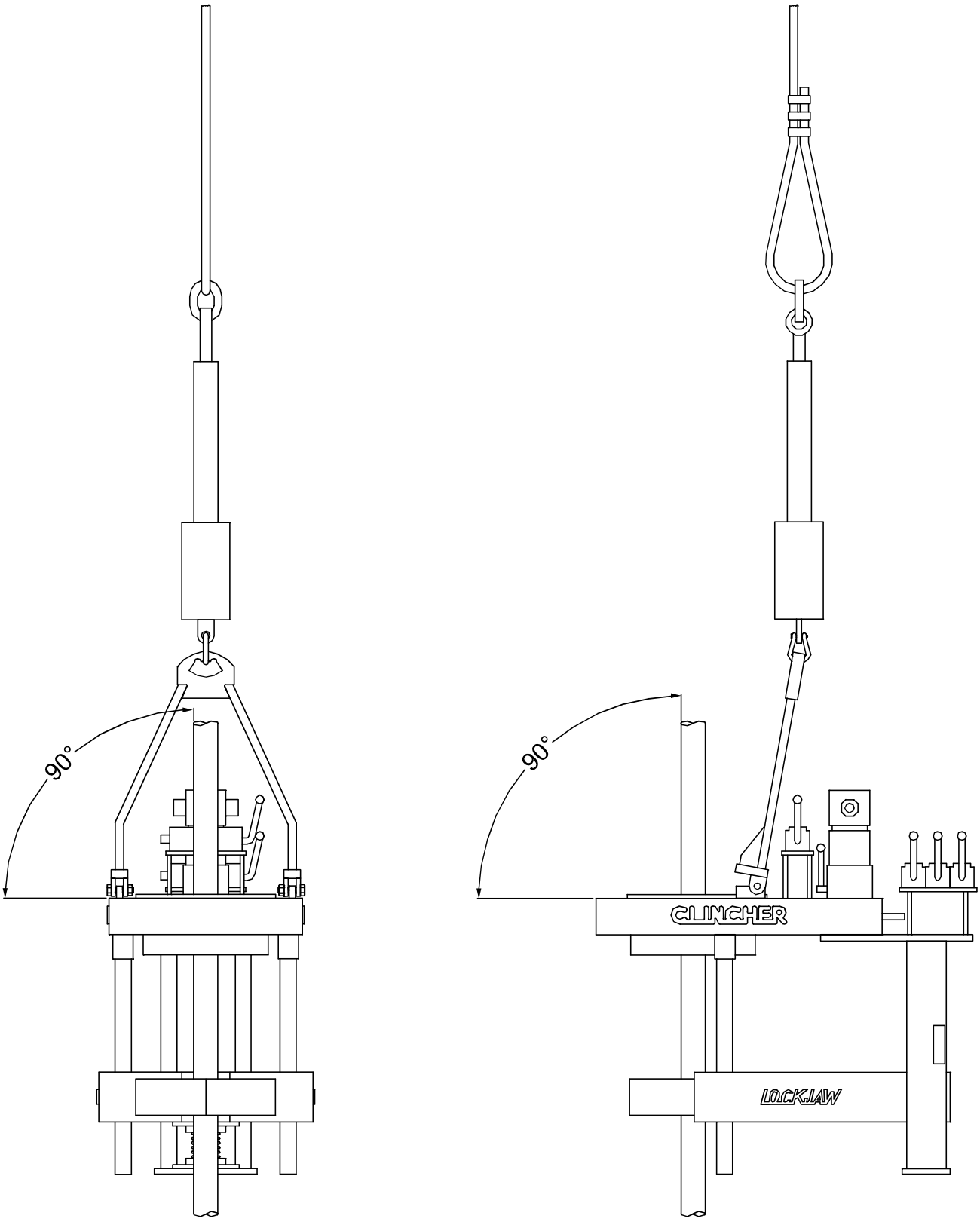
B) Always inspect hoses prior to installation for abrasions, kinks, and other visible damage.

C) Install hydraulic supply hose and hydraulic return hose between tong and hydraulic power unit. Be advised that the standard installation on **CLINCHER®** tong calls for 1" Hydraulic Supply hose and 1-1/4" Hydraulic Return hose. The differing hoses eliminates the possibility of attaching the wrong hose to the wrong outlet while at the same time reducing back pressure in your hydraulic system.



TYPICAL SNUB LINE INSTALLATION

NOTE: SNUB LINE IS PERPENDICULAR
TO AXIS OF TONG



TYPICAL TONG INSTALLATION

NOTE: TONG IS PERPENDICULAR
TO TUBING

OPERATION

Tong Operation

A. Insure proper dies are installed. Connect hydraulic hoses, verify reservoir is full of hydraulic fluid and insure suction valve is open.

B. Open bypass valve to hydraulic system, then check to make sure all hose connections are secure and hydraulic system is free of leaks.

C. Be certain door is completely closed before operation to insure safe operation. The **CLINCHER®** CLES5500HT is equipped with a door switch, which prevents operation of the tong when door is even partially open.

D. Use power unit to start up procedure as outlined in your owners manual supplied by the manufacturer.

E. In the event hoses are not tightened securely, possible failures to hydraulic system can occur.

   1) If pressure supply hoses are restricted or flow is blocked, pressure will increase in the hydraulic power unit, resulting in increased RPM in the power unit.

   2) If return line hoses are restricted or flow is blocked, pressure will increase in the hydraulic power unit and the hydraulic system to the tong itself, resulting in the tong motor increasing to maximum pressure and possible motor seal failure.

F. After completion of A through E restart the power unit and allow engine to idle for approximately 10 minutes. Slowly close bypass valve to allow circulation of hydraulic oil through tong and hoses. Place shifting lever into low and rotate several times. Repeat in reverse. If correct jaw-die combination is installed, the unit is now ready to run pipe.

G. Adjust height of tong to proper height, using the control valve located all the way to the right of rear valve bank assembly.

H. Stand in the normal operators position, insert the locking pin into the rear cage plate hole (on operators side). This pin allows ring gear to rotate clockwise (make-up) and engage the can to close jaws on pipe.

I. Rotate ring gear clockwise by pushing motor control lever on the front valve bank assembly forward until jaws lock on pipe and continue to rotate until desired amount or torque is applied.

J. After correct amount of torque specific to that connection has been applied, release tong jaws by pulling back on motor control lever until jaws release and throat in cage plate is aligned with door opening. Open door.

K. High and low gear is adjusted by use of shifting lever PN 45060, located to the left side of the shifting housing. With the lever in the upwards position the tong is in high gear. With the shifting lever in the downward position, the tong is in low gear.

MAINTENANCE

CLINCHER® recommends that owners of **CLINCHER®** Hydraulic Power Tongs, **CHROMEMASTER™**s, and accessories adapt a regularly scheduled maintenance program. Implementation of this type of program offers several benefits. First you increase the life of your equipment, secondly, you may find a problem before it escalates to a costly repair or down time on the job, and most important, prevent injury to operating personnel.

A major inspection (described at the end of this section) should be carried out if equipment is suspected to have been damaged during transit or is to be mobilized to a remote location where maintenance operations are difficult to carry out.

Routine Maintenance

Cleaning - Upon return from each and every job:

A) Pre-wash unit to remove majority of dirt and grease build up as to allow removal of dies, and inspection of overall condition of unit.

B) Remove and inspect dies from tong. Note any missing or damaged die retainers and/or die retainer bolts.

C) Remove side jaws from tong and inspect side jaw for missing or broken parts, damaged splines, broken ears (locking hooks on front portion of side jaws).

D) Clean and inspect side jaws, jaw pins, jaw rollers for damage or excessive wear (cracks, breakage, and uneven wear patterns). Reassemble jaw sections replacing any damaged parts. Lubricate pins and rollers, and reinstall in tong.

E) Inspect hanger and all hoses for wear, replace as necessary.

F) Inspect hanger assembly to assure all parts are returned and in operating condition. (*i.e.* H-Plates, spring, leg springs, leg spring caps and pins)

G) Lubricate tong's cam followers (upper and lower), dumbell roller shafts, door shaft, idler gear shafts (2), pinion gear assembly, and shift housing (2 zerts), and re-pack tong body cavity.

H) Install dies of a size needed for testing purposes, and attach hydraulic power unit to tong. Before energizing power unit make certain no one is working on tong and all tools and parts are removed from the tong.

I) With the proper dies installed in the tong, place reversing pin into the make-up position, set tong into low gear and operate tong through several cycles of locking, biting, and torqueing to required torque. Change reversing pin to break-out position and repeat. Repeat same procedure in high gear.

   Note: Torque developed in high gear is considerably less than torque developed in low gear.

MAINTENANCE

J) Test door interlock system by opening door slightly with tong rotating. (Remove test mandrel for this procedure.) The tongs rotation should stop. If tong rotation fails to stop, close door, cease rotation, deactivate power unit, and inspect door interlock switch for damage. Insure that adjustment collar is oriented to allow wheel of door switch to fit into recess on collar.

Warning: If door switch system is not functioning properly tong must not be used.

K) Re-inspect tong hydraulic system for leaks.

L) If at this time the unit is functioning as intended, replace all covers and grease splines in tong, tape or grease spools on control valves (to prevent paint from adhering to polished spool surface), prime and paint unit for storage.

MAINTENANCE

Recommended Lubrication Schedule Performed after Completion of Each Job

Hydraulic Tong

A) Cam followers: upper and lower (all)
B) Dumbell roller shafts: (all)
C) Door shaft
D) Idler shafts (2)
E) Shift housing (2 zerts)
F) Re-pack tong cavity
G) Pinion gear shaft
H) Jaw rollers and pins. Remove jaw pins and rollers, clean and lubricate with gear grease.
I) Inspect hydraulic fluid for foreign material and contaminants. Filter or replace. You must filter or replace entire system including power unit tank and lines along with tong to insure all contaminants are removed.

Annual Major Maintenance

Inspection and Repair

Routine preventative maintenance will significantly extend the operating life of your equipment, reduce operating cost and avoid downtime. **CLINCHER®** recommends a program of frequent routine inspection, and if equipment is suspected to have been damaged during transit or is to be mobilized to a remote location where maintenance operations are difficult to carry out, perform the following:

A) Visually inspect components on power tong which could possibly have been damaged either during operation or transit. *i.e.* Damage to hanger assembly, mounting legs, or hydraulic valve assembly.

B) Check test date. Ensure that a load test and inspection was carried out within the last 9 months.

C) Check ring gear. Check for any signs of damage or wear.

D) Remove motor and valve assembly from tong body.

E) Check motor seal. Apply hydraulic power, run motor and visually check motor seal for any signs of leakage.

F) Check drive gear, high and low pinion gears. Check for excessive sign of wear on motor gear.

G) Check condition of control valve spools. Activate valves and check for any sign of wear, pitting, or scoring of the chrome surface of spools. If spool is damaged in any way, the complete section must be changed out. Spools are not interchangeable.

MAINTENANCE

H) Check gear selector and shaft. Visually inspect shifting shaft for alignment and straightness.

I) Check Hi/Low Gear assembly. Visually inspect high and low clutch and gears for any sign of chipped, broken, or worn teeth.

J) Check dumbell rollers, shafts, and bushings. Check for excess movement on either bearings, bushings, shafts, or dumbells.

K) Check idler gears and center pinion shaft gears and bearings. Check that there are no signs of worn, chipped, or broken teeth on idler and center pinion shaft gears.

L) Check door bearings. Visually check excess movement on bearings at door assembly. If excess movement is found, door must be removed making careful note of bearing washer positions for reassembly.

M) Check door switch system. Visually check that door switch valve has sufficient strength to hold door in closed position. If this is not the case, then repairs are required.

N) Check door safety device. Functionally check tong door safety switch. Engage low gear, open tong door and push rotor control lever forward as if to rotate rotor. If safety device is operational then the rotor will not rotate.

O) Check lifting hanger test date. Check lifting hanger for damage. Ensure that a load test and inspection was carried out within the last 9 months.

P) Check condition of all hydraulic hoses and fittings. Visually inspect all hydraulic hoses fitted to the tong for any signs of leaks, cuts, or wear.

Q) Reinstall all parts which were removed for inspection and/or damage. Connect to hydraulic power supply and function test operation of tong in high, low, forward, and reverse. Torque test utilizing appropriate dies and test mandrel. Test operation of lift cylinder.

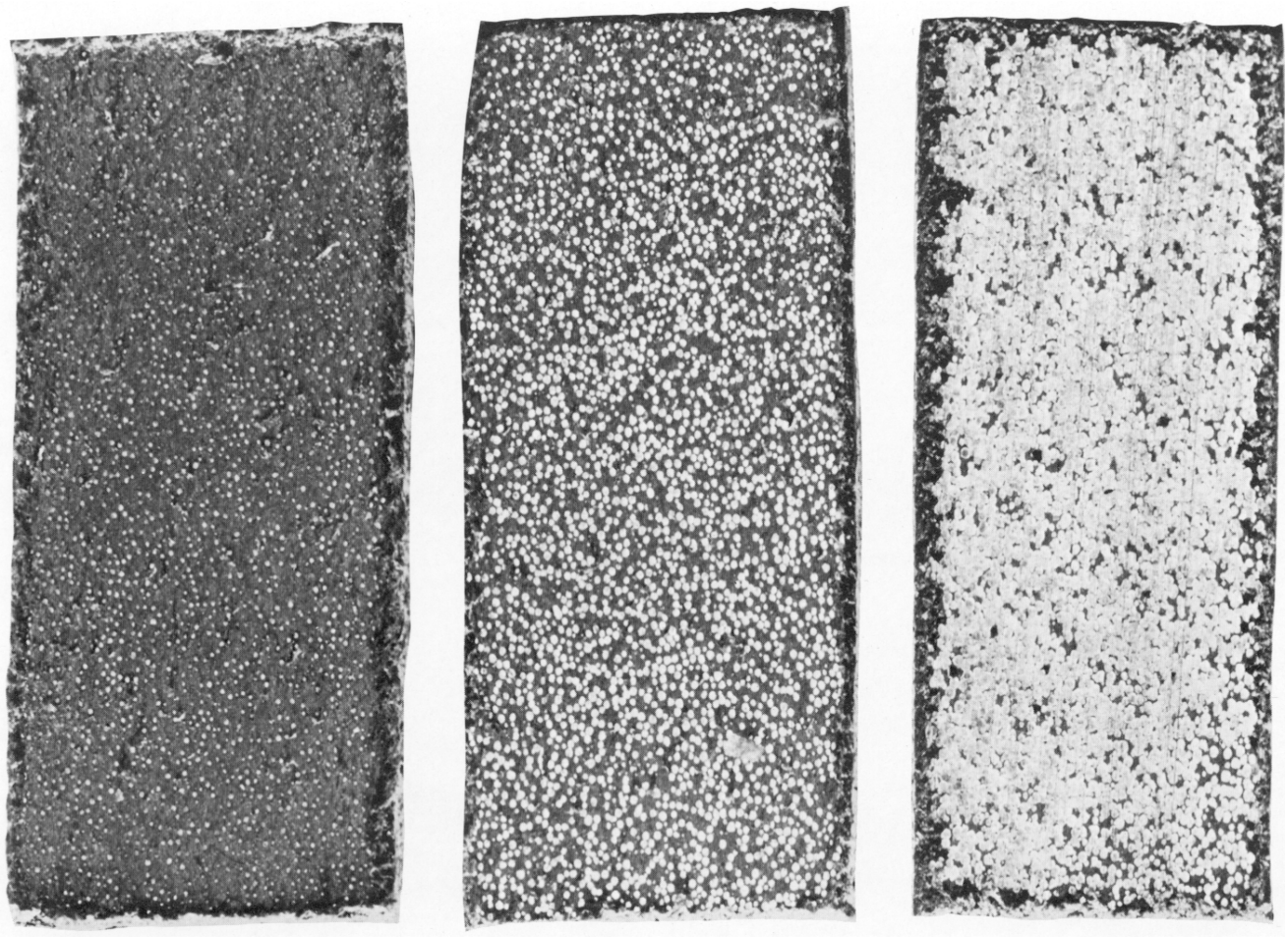
R) Inspect power unit system according to manufactures specifications.

S) Lubricate tong according to maintenance schedule preceding this section.

T) Paint, remembering to mask off surfaces not intending to paint with grease or masking tape.

U) Complete dated inspection report giving details of all duties performed along with complete list of items replaced.

DU® BEARING DRY WEAR PROCESS



1. 2. 3.

1. Running-in completed. Low wear rate starts when up to 10% of the bronze is exposed.

2. Typical surface appearance when DU® bearing approaches its half life with 40% to 50% of the bronze exposed.

3. Bronze is beginning to smear near the end of DU's useful life as a dry bearing. Over 75% of the bronze is visible at the surface.

For additional information about DU bearings, please contact Garlock Bearings Inc,
700 Mid Atlantic Parkway, Thorofare, New Jersey 08086. **(609) 848-3200** FAX: (609) 848-5115

TROUBLE SHOOTING

HYDRAULIC SYSTEM

Hydraulic Pump Making Excessive Noise:

	Problem	Solution
A)	Restricted or clogged intake line	Clean line, check for contamination.
B)	Contaminated fluid	Flush system, change fluid.
C)	Restricted vent	Clean or replace air vent.
D)	Air in fluid	Check for leaks and be certain fluid suction in tank is well below hydraulic fluid in reservoir.
E)	Damaged or worn parts	Repair or replace damaged parts, check fluid for contamination.
F)	Excessive RPM	Check PTO, gears, and recommended speed to assure proper pump is installed for operation.
G)	Increased friction	Make sure pump has been assembled using correct torque values.
H)	Damaged or worn relief valve.	Replace relief valve.
I)	Damaged or worn check valve.	Replace check valve.
J)	Restricted discharge	Check to make sure relief valve is set to proper pressure.
K)	Valve system restricted	Inspect and repair or replace defective parts, check system for contamination.

TROUBLE SHOOTING

Excessive Wear to Hydraulic Components:

	Problem	Solution
A)	Fluid contamination	Flush fluid system, replace with new fluid.
B)	Components misaligned	Inspect and realign.
C)	High operating pressures	Gauge and set to proper pressure.
D)	Exhausted fluid (depletion of additives)	Flush fluid system, replace with new fluid.
E)	Air in fluid	Check for leaks, and be certain fluid suction in tank is well below hydraulic fluid in reservoir.
F)	Shortened bearing life	Check alignment, insure proper lubrication to non-sealed bearings.

HYDRAULIC TONG SECTION

Slow Tong Speed:

	Problem	Solution
A)	Restricted supply line	Clear supply line and check intake on reservoir.
B)	Low fluid level	Add fluid to proper volume.
C)	Air leak	Locate and repair leak.
D)	Pump speed insufficient	Assure proper pump speed for application.
E)	Damaged or worn equipment	Isolate pump and check pressure to determine whether motor or pump is defective. Repair or replace defective part.
F)	Pump not primed	Check fluid viscosity and restrictions of intake line. Replace fluid if inadequate for operating temperature.
G)	Low or no flow from supply line	Check to assure couplings are securely fastened.
H)	Hydraulic bypass valve malfunction	Inspect. Adjust unloading pressure. Replace or repair as necessary.

TROUBLE SHOOTING

Insufficient Torque:

	Problem	Solution
A)	Door switch malfunctioning	Check to make sure door is completely closed. Inspect door switch and dump valve. Replace or repair door switch and/or dump valve.
B)	Relief valve malfunctioning	Relief set too low, broken valve spring, contamination or defective seals.
C)	Damaged or worn pump parts	Inspect, repair, or replace.
D)	Slow pump speed	Assure proper pump speed for application.
E)	Improper system fluid	Check fluid viscosity and replace fluid if inadequate for operating temperature.
F)	Directional control valve set improperly	Check relief and directional control valve. Neutral should return slightly to reservoir.

Hydraulic Tong System:

	Problem	Solution
A)	Damage to motor	Inspect, repair, or replace.
B)	Restriction of supply line, excessive back pressure	Check to assure couplings are securely fastened.
C)	Defective gauge or load cell	Inspect, repair, or replace. Assure unit has been calibrated to proper arm length. NOTE: When using **CLINCHER®** integral backup system, it is the length of backup arm, NOT the tong arm length.

TROUBLE SHOOTING

Difficulty Shifting Gears:

	Problem	Solution
A)	Broken key in shifting yoke	Inspect and replace key stock in shifting yoke.
B)	Worn or damaged shifting yoke pins	Inspect and replace broken or worn pins.
C)	Insufficient lubrication	Pump grease into both zerts located on shift housing.
D)	Detent ball bearing spring set too tight	Inspect and relieve pressure by adjusting set screw on shifting gear PN 55084.

Failure to Grip Tubulars:

	Problem	Solution
A)	Jaws move out from neutral, but fail to penetrate pipe. Tong not perpendicular.	Inspect die size and replace with correct dies for pipe. Wrong size dies for tubulars. Assure suspension of tong is perpendicular to tubulars. Adjust hanger as necessary.
B)	Jaws fail to move out of neutral. Brake band not tight enough, faulty cam followers, rust debris or damage to jaws.	Inspect for excessive wear on brake band. Inspect and replace defective cam followers. Remove rust and debris from jaws, and jaw pockets. Inspect jaw rollers and pins for wear, flats, and lubrication. Repair, replace, and lubricate as needed.
C)	Tong will not release from tubular. Brake band not tight enough, defective cam followers in cage plate, insufficient lubrication to jaw pin and roller.	Inspect for excessive wear on brake band. Inspect and replace defective cam followers. Remove rust and debris from jaws, and jaw pockets. Inspect jaw rollers and pins for wear, flats, and lubrication. Repair, replace, and lubricate as needed.

TROUBLE SHOOTING

Failure to Grip Tubulars:

	Problem	Solution
D)	Tong motor runs but ring gear does not rotate. Broken gears or defective shift in hydraulic tongs system.	Inspect and replace defective gears. Inspect and repair or replace defective shifting parts.
E)	Tong binds under light load. Worn or damaged cam followers, dumbell roller bearing, or idler bearing.	Inspect and replace defective parts.
F)	Ring gear rotates while control lever is in neutral.	Replace control valve.
G)	Shift will not stay in set position. Lost detent ball or spring.	Replace detent ball and spring.
H)	Hydraulic fluid leaking from motor. Damaged or worn motor shaft seal.	Replace motor shaft seal.

HYDRAULIC BACKUP SYSTEM

	Problem	Solution
A)	Incorrect die for size tubular	Check pipe OD and match die size to pipe OD.
B)	Dies have material compacted in tooth area; worn teeth.	Clean dies with wire brush and inspect. Replace with new dies if necessary.
C)	Power unit pressure set incorrectly	Inspect relief valve on power unit to make sure enough system pressure is being delivered to backup.
D)	Counter balance valve not holding pressure	Remove side plates on backup. Bench test and replace the defective counter balance valve.
E)	Internal leakage in backup cylinder	Disconnect lines and bench test cylinder. Repair or replace as necessary.
F)	Jaws will not retract. Counter balance valve is stuck.	Replace counter balance valve.
G)	External leakage of cylinder	Repair or replace cylinder.
H)	Control valve set to neutral, but jaws extend.	Inspect control valve for damage and/or incorrect spool. Repair or replace as necessary.

SECTION 7 PARTS LISTS

RECOMMENDED TONG SPARE PARTS LIST

	Part Number	***Quantity***	***Description***
Rineer Motor Seal Kit	12501375	1	Seal for Rineer Motor
	MCN-1377	1	Wiper for Rineer Motor
	2-150	1	O Ring
2 1/16" - 5 1/2" Std. Jaw	51026	2	Standard Jaw Pin
	45028	2	Standard Jaw Roller
	2-222	8	Jaw Retract O Ring
	1071	2	3/8"-16 x 3 1/2" HHCS
	1011	2	1/4"-20 x 3 3/4" SHCS
2 1/16" - 3 1/2" Std. Jaw	45027-T	2	Top Jaw Clip
	45027-B	2	Bottom Jaw Clip
3 5/8" - 5 1/2" Std. Jaw	51027-T	2	Top Jaw Clip
	51027-B	2	Bottom Jaw Clip
2 1/16" - 3 1/2" LF Jaw	51022	2	Low Friction Jaw Pin
	51021	2	Low Friction Jaw Roller
	22DU28	4	Garlock Bushing
	2-220	8	Jaw Retract O Ring
	51063-01	1	Long Brake Band Assy.
	51063-02	1	Short Brake Band Assy.
	SLV1000-01	1	Door Switch Assembly
	45061	1	Shifting Yoke (Obsolete 12/11/01)
	45072	1	Shifting Yoke f/Assy. 45091
	45055	10	Dumbell Roller Bushing
	1001	8	1/8 NPT Zert
	VA20-MRV-1	1	A-20 Relief Cartridge

RECOMMENDED BACKUP SPARE PARTS LIST

	Part Number	***Quantity***	***Description***
	ASAP2316	1	Cylinder Kit
	BUC6505	3	Top Clip
	BUC6506	3	Bottom Clip
	1020	6	1/4"-20 x 4 1/4" SHCS

ACCESSORIES AND OPTIONS

Several different accessory items are available for the **CLINCHER®** Tong to allow them to be customized to provide a system most appropriate for the inducer's application.

CLES5500HT Tong Accessories

Compression Load Cell and Torque Gauge	directly measures applied torque
Tension Load Cell and Torque Gauge	directly measures applied torque
Solenoid Operated Module for Dump Valve	allows computer to limit torque applied
Adapter for Turns Proximity Switch	allows computer to sense rotation
3 Point Lifting Bridle	alternative lifting system
Lift Cylinder with Integral Spring Hanger	controls vertical position
TSP-80 Tong Speed Control	allows slow speed rotation with full torque
2 Speed Motors	
Alternate Motor Displacements	

BUC6375 Backup Accessories

Backup Handles	Simplifies manipulation
Shipping Skids and Cages	Simplify handling, transport and help guard against damage

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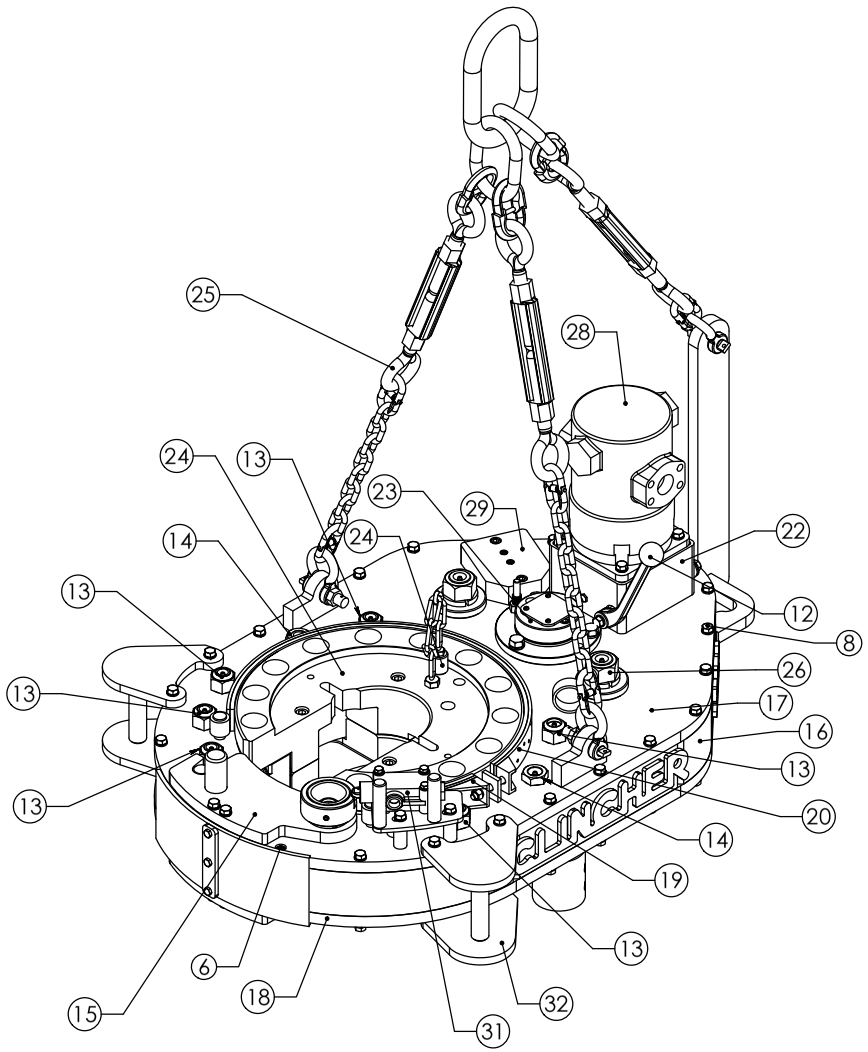
5 1/2" STD & HT TONG DOVETAIL JAW ASSEMBLY ..... 9 - 23
5 1/2" STD & HT TONG LOW FRICTION DOVETAIL JAW ASSEMBLY ..... 9 - 24



Item #	Qty.	Part Number	Part Name
1	4	100	1/4"-20 HEX NUT GR8
2	1	1001	1/8 NPT ZERT
3	4	101	1/4" LOCKWASHER
4	2	1024	3/8-16 NUT (1024)
5	33	1027	WASHER, LOCK 3/8"
6	11	1041	3/8-16x1 1/4 SHCS
7	2	1047	3/8"-16 X 1" HHCS
8	31	1049	3/8"-16 X 1 1/2" HHCS
9	4	110	1/4"-20 X 2 1/4" HHCS
10	2	238	3/8"-16 x 1 1/2" SHCS
11	2	240	3/8-16 x 2 1/2 SHCS
12	1	45091	SHIFT ASSEMBLY
13	7	45122A	DUMBELL ROLLER ASSEMBLY
14	2	45122B	DUMBELL ROLLER ASSEMBLY
15	1	51051	INTEGRATED DOOR ASSEMBLY
16	1	51047A-01	MID BODY F/5 1/2" BJ
17	1	51056	TOP PLATE WELDMENT
18	1	51055	BOTTOM PLATE WELDMENT
19	2	51063-02	SHORT BRAKE BAND ASSEMBLY
20	2	51063-03	LONG BRAKE BAND ASSEMBLY
21	1	51067-S1	DOOR JAMB
22	1	51067-S3	CLUTCH HOUSE WELDMENT
23	1	51074	ENCODER ASSEMBLY
24	1	51080-01	RING GEAR/CAGE PLATE ASSEMBLY
25	1	55001-04	BRIDLE ASSEMLBY
26	2	58216	IDLER GEAR ASSEMBLY
27	1	58217	PINION GEAR ASSEMLBY
28	1	58218	MOTOR/DRIVE GEAR ASSEMLBY
29	1	76103BJ	TURNS ENCODER MOUNT ASSEMBLY
30	1	76128	BACKUP SENSOR/ DOOR SWITCH MOUNT WELDMENT
31	1	SLV1000-01	NC SELF LUBRICATED VALVE-NORMALLY CLOSED
32	2	51113	SIDE HANDLE WELDMENT

APPROX.WEIGHT (lbs.) = 853

Rev.#	By	Log#	Description of Revision
6			
5			
4			
3			
2			
1	RM	ECN08-0441	REMOVED (2) 45122A AND REPLACED WITH 45122B

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE

2 PLACE DEC.	3 PLACE DEC.	FRACTIONS	ANGLES	SURFACE	FLATNESS AR PL.
±.020	±.005	± 1/16	± .5°	250	± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

Third angle projection

SUPERIOR Manufacturing & Hydraulics
4225 HWY.90 E
BROUSSARD, LA. 75018
PH: 337-837-8847
FAX: 337-837-8839

PART NAME: 5 1/2" HT TONG FOR BJ

PART #: CLES5500HT-03

DRAWN BY: Rizal Masingkan

APPROVED BY: DSB | CHK BY: MFG

DATE: 9/8/2008

SHEET 1 of 1 1:10

MATERIAL SPECIFICATION

Matl.Req:

Initial Condition:

Alternate Matl:

H.T Instructions: Case Depth:

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=Revision No. =STAMP,ETCH,TAG =Machine Zero

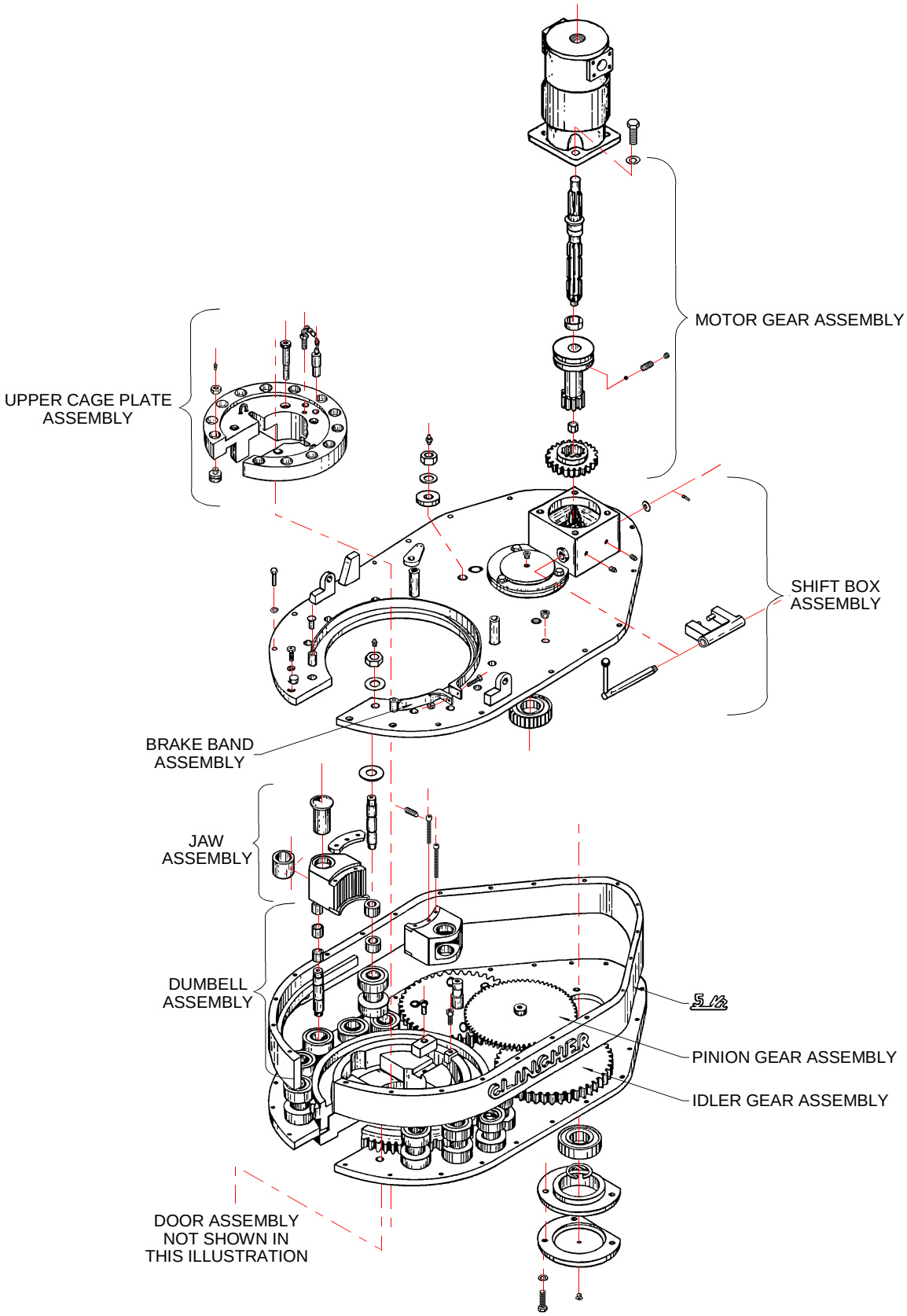
1.000 = Critical Dimension 100% Inspection Required

SolidWorks document Printed on Friday, December 05, 2008 CAD File Location: P:\Engineering\Parts\C\

X TAG / LABEL P/N & MATL. P.O.

ETCH P/N & MATL. P.O. ON NON-CRITICAL SURFACE

1/8 LS STAMP P/N & MATL. P.O. ON NON-CRITICAL SURFACE



5 1/2" HT TONG ASSEMBLY

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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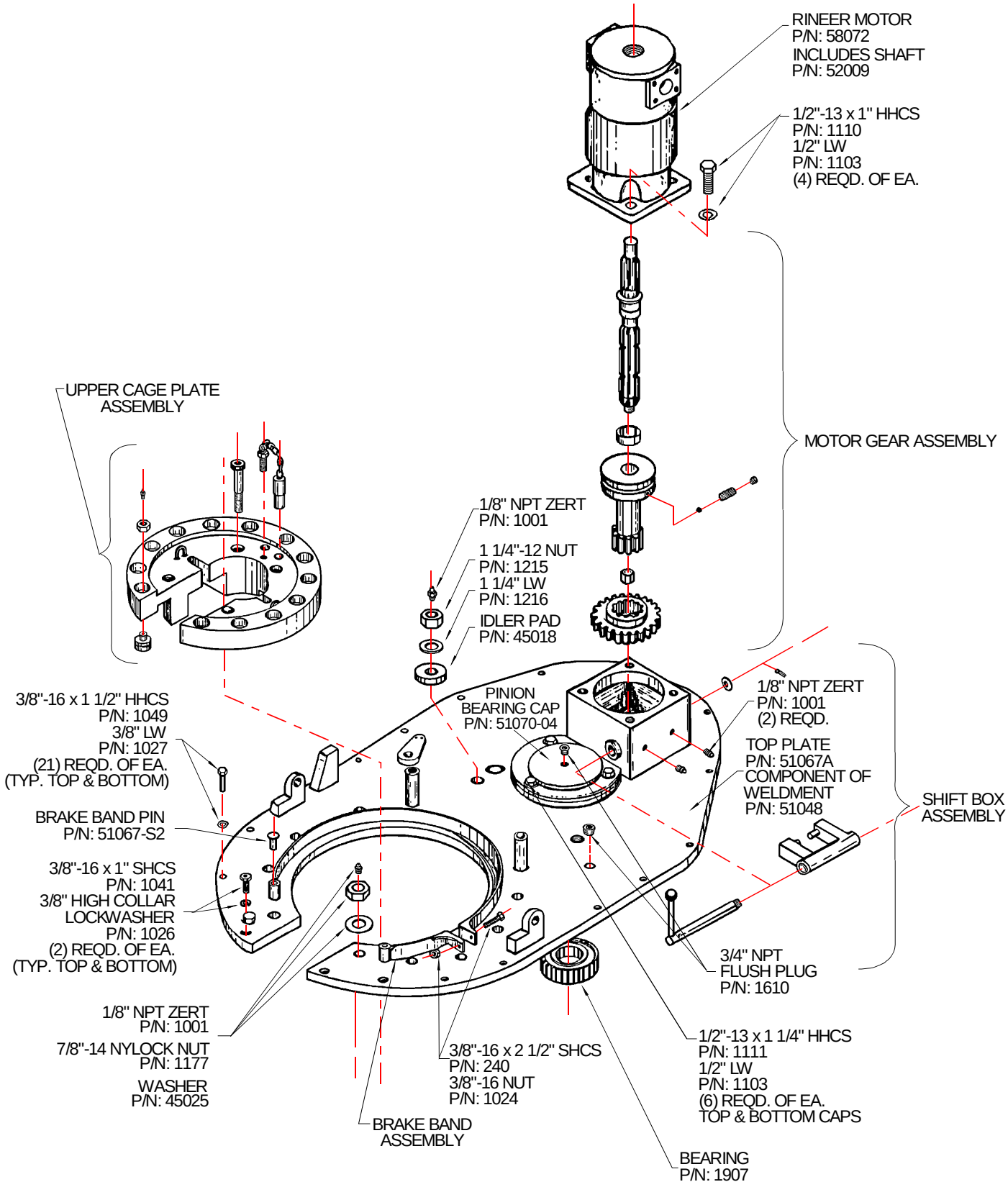
		10/24/03
REV. #	LOG #	DATE

REF: P:\Manuals\Equip Manuals\Dwgs\CLES5500HT\Assembly sht1-3.wpg



5 1/2" HT TONG ASSEMBLY

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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REV. #	LOG #	DATE
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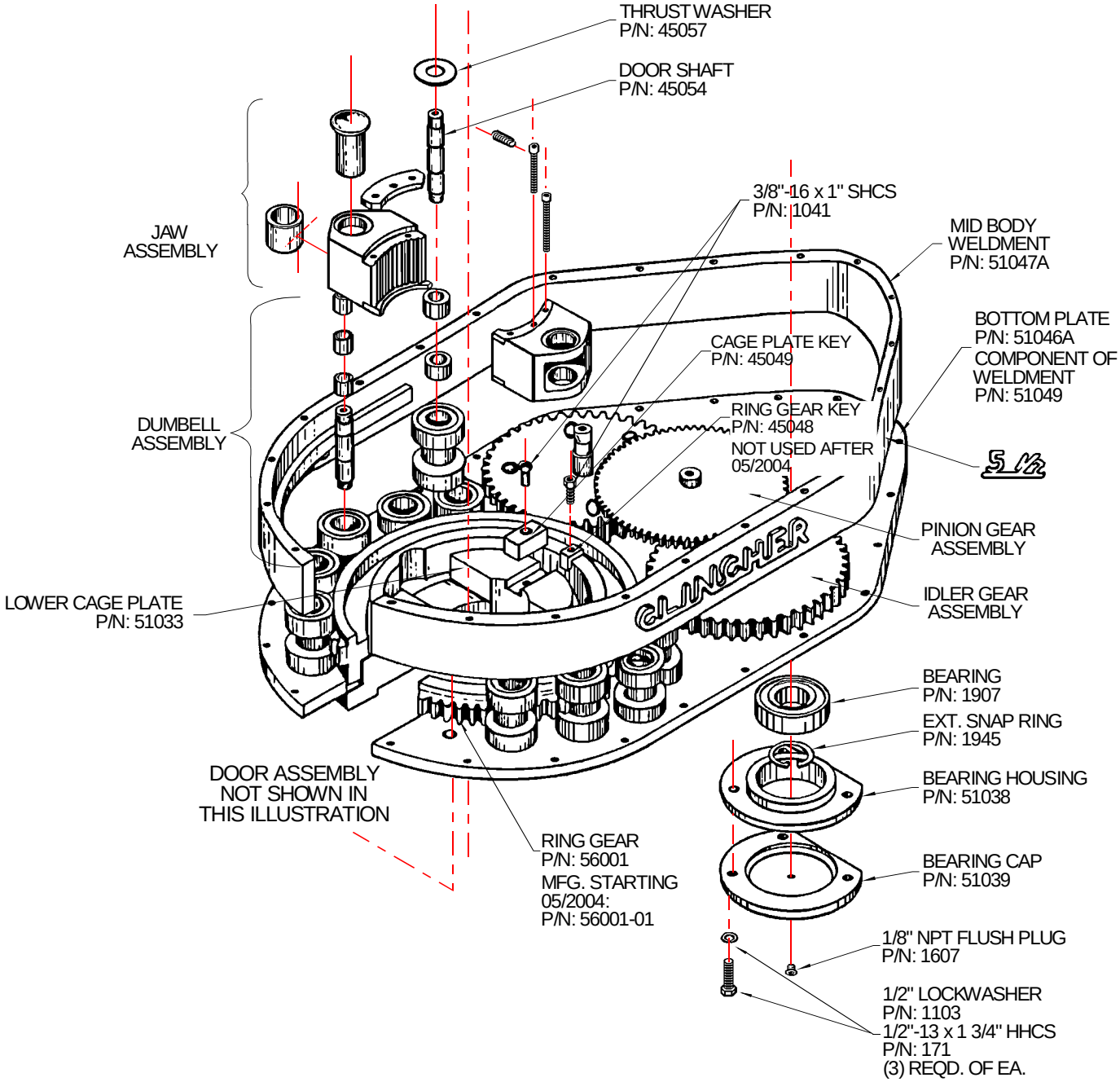

5 1/2" HT TONG ASSEMBLY

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4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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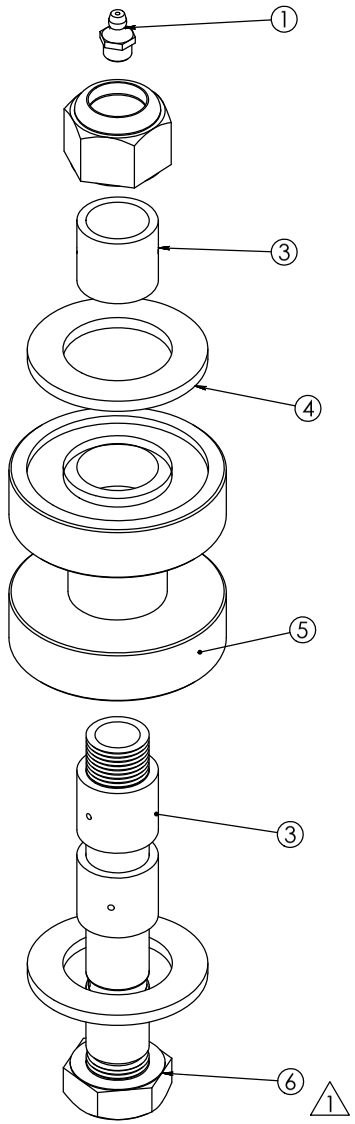
REV. #	LOG #	DATE
1		07/20/06

REF: P:\Manuals\Equip Manuals\Dwgs\CLES5500HT\Assembly sht3-3 rev1.wpg



Item #	Qty.	Part Number	Part Name
1	1	1001	1/8 NPT ZERT
2	1	1177	7/8"-14 NYLOCK NUT
3	3	1955	DOOR BUSHING
4	2	45057	DUMBELL THRUST BUSHING
5	1	45122	DUMBELL ROLLER ASSEMBLY
6	1	58212	DUMBELL ROLLER SHAFT WELDMENT

APPROX.WEIGHT (lbs.) = 4

Rev.#	By	Log#	Description of Revision
6			
5			
4			
3			
2			
1	RM	ECN08-0441	REMOVE 45031 AND REPLACED WITH 58212

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE

2 PLACE DEC.	3 PLACE DEC.	FRACTIONS	ANGLES	SURFACE	FLATNESS AR PL.
±.020	±.005	± 1/16	± .5°	250	± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

Third angle projection

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△ ⬡ =Revision No. Ⓧ =STAMP,ETCH,TAG ⊕ =Machine Zero

1.000 = Critical Dimension 100% Inspection Required

SUPERIOR Manufacturing & Hydraulics
4225 HWY.90 E
BROUSSARD, LA. 75018
PH: 337-837-8847
FAX: 337-837-8839

PART NAME: DUMBELL ROLLER ASSEMBLY

PART #: 45122A

DRAWN BY: Rizal Masingkan

APPROVED BY: DSB | CHK BY: MFG

DATE: 09/18/2008

SHEET 1 of 1 1:2.5

MATERIAL SPECIFICATION

Matl.Req:

Initial Condition:

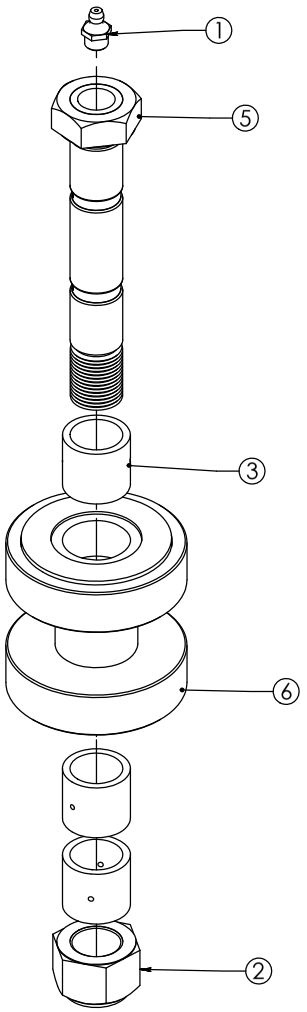
Alternate Matl:

H.T Instructions: Case Depth:

X TAG / LABEL P/N & MATL. P.O.

ETCH P/N & MATL. P.O. ON NON-CRITICAL SURFACE

1/8 LS STAMP P/N & MATL. P.O. ON NON-CRITICAL SURFACE



Item #	Qty.	Part Number	Part Name
1	1	1001	1/8 NPT ZERT
2	1	1177	7/8"-14 NYLOCK NUT
3	3	1955	DOOR BUSHING
4	2	45057	DUMBELL THRUST BUSHING
5	1	45058	DUMBELL ROLLER SHAF WELDMENT
6	1	45122	DUMBELL ROLLER ASSEMBLY

APPROX.WEIGHT (lbs.) = 4

Rev.#	By	Log#	Description of Revision
6			
5			
4			
3			
2			
1			

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE

2 PLACE DEC.	3 PLACE DEC.	FRACTIONS	ANGLES	SURFACE	FLATNESS AR PL.
±.020	±.005	± 1/16	± .5°	250	± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

Third angle projection

SUPERIOR Manufacturing & Hydraulics
4225 HWY.90 E
BROUSSARD, LA. 75018
PH: 337-837-8847
FAX: 337-837-8839

PART NAME: DUMBELL ROLLER ASSEMBLY

PART #: 45122B

DRAWN BY: Rizal Masingkan

APPROVED BY: DSB | CHK BY: MFG

DATE: 09/18/2008

SHEET 1 of 1 1:3

MATERIAL SPECIFICATION

Matl.Req:

Initial Condition:

Alternate Matl:

H.T Instructions: Case Depth:

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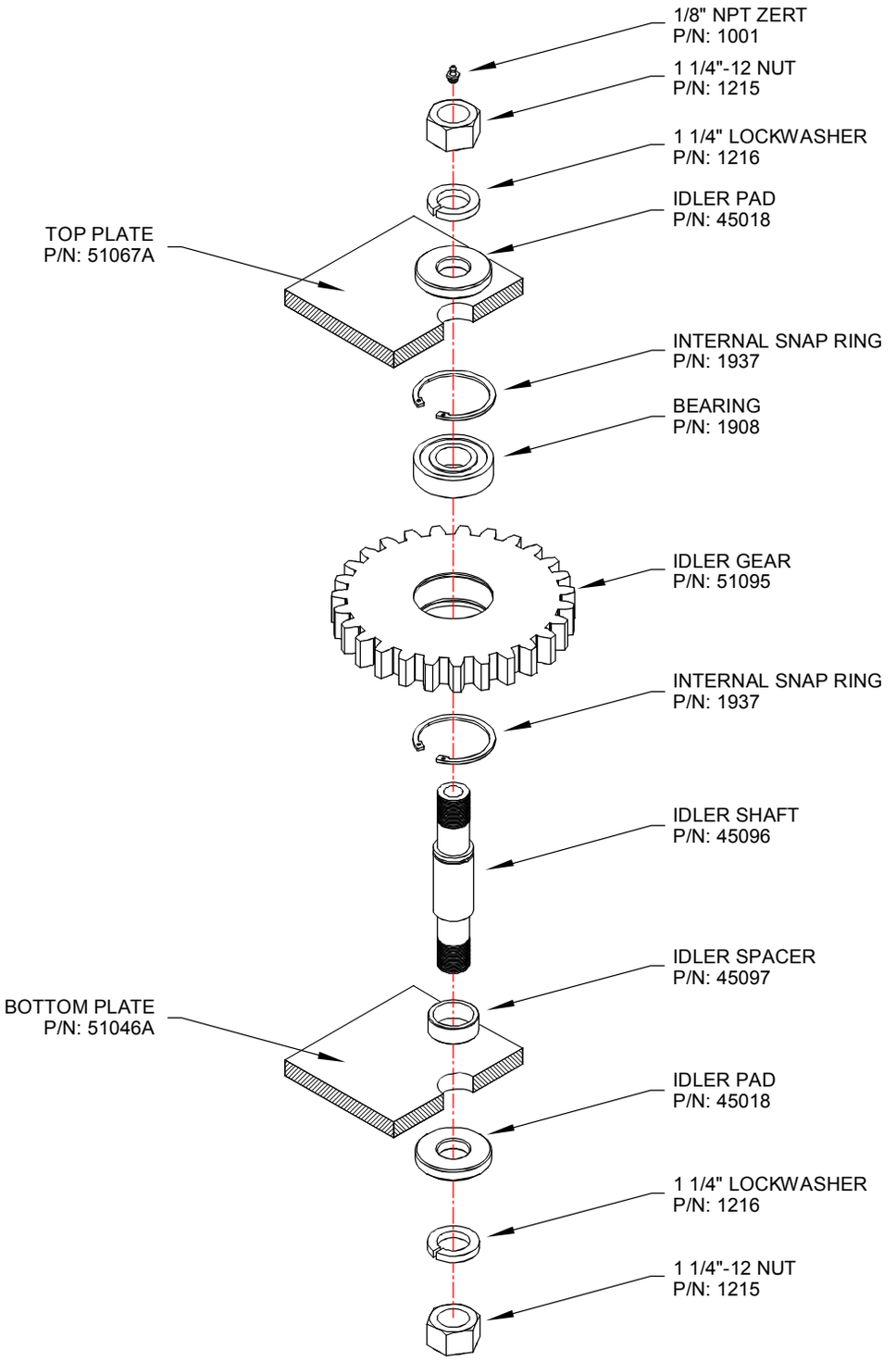
△ ⬡ =Revision No. Ⓧ =STAMP,ETCH,TAG ⊕ =Machine Zero

1.000 = Critical Dimension 100% Inspection Required

X TAG / LABEL P/N & MATL. P.O.

ETCH P/N & MATL. P.O. ON NON-CRITICAL SURFACE

1/8 LS STAMP P/N & MATL. P.O. ON NON-CRITICAL SURFACE



IDLER GEAR ASSEMBLY

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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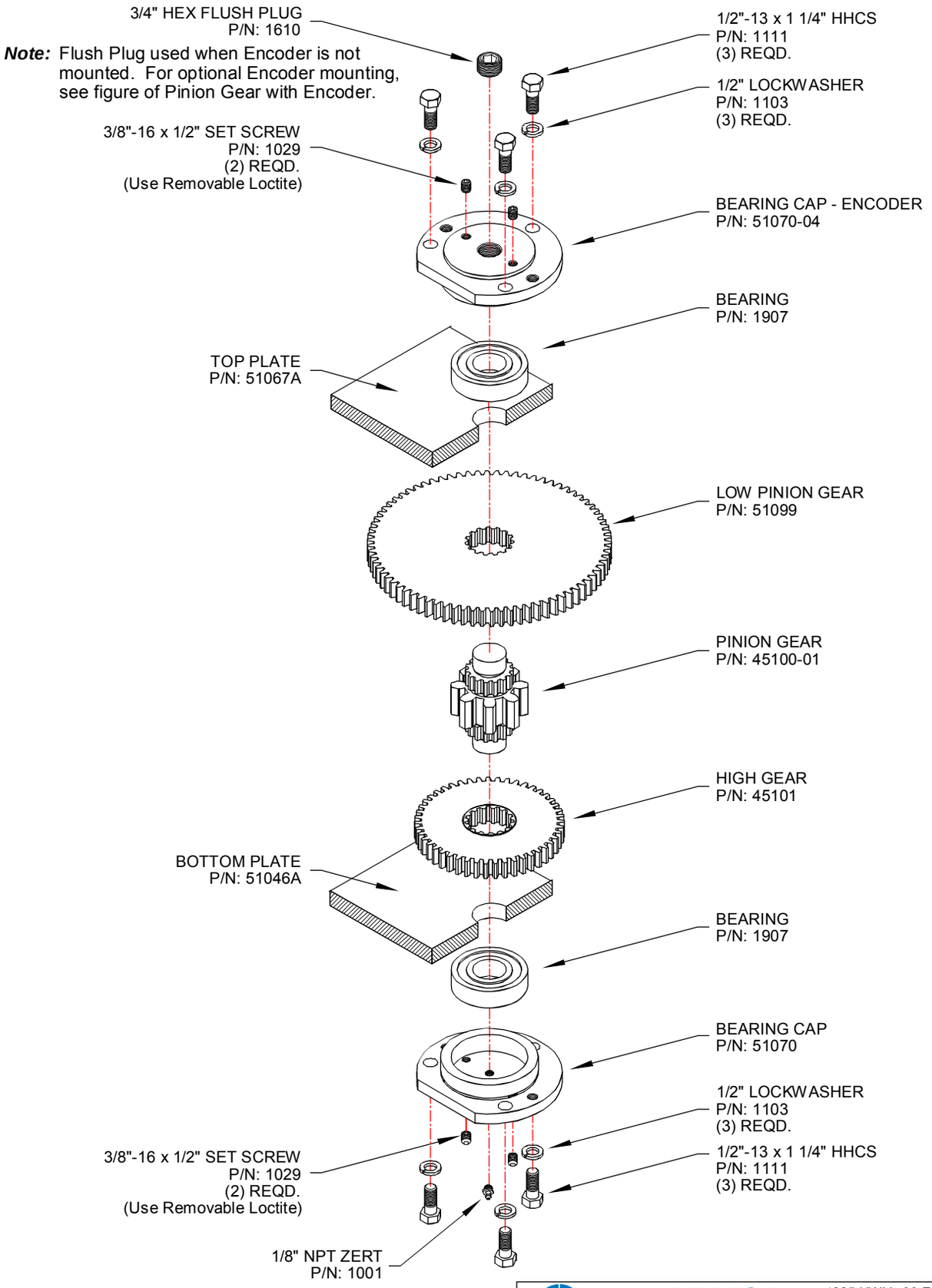
		10/27/00
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\CLES5500\Idler.wpg



PINION GEAR ASSEMBLY

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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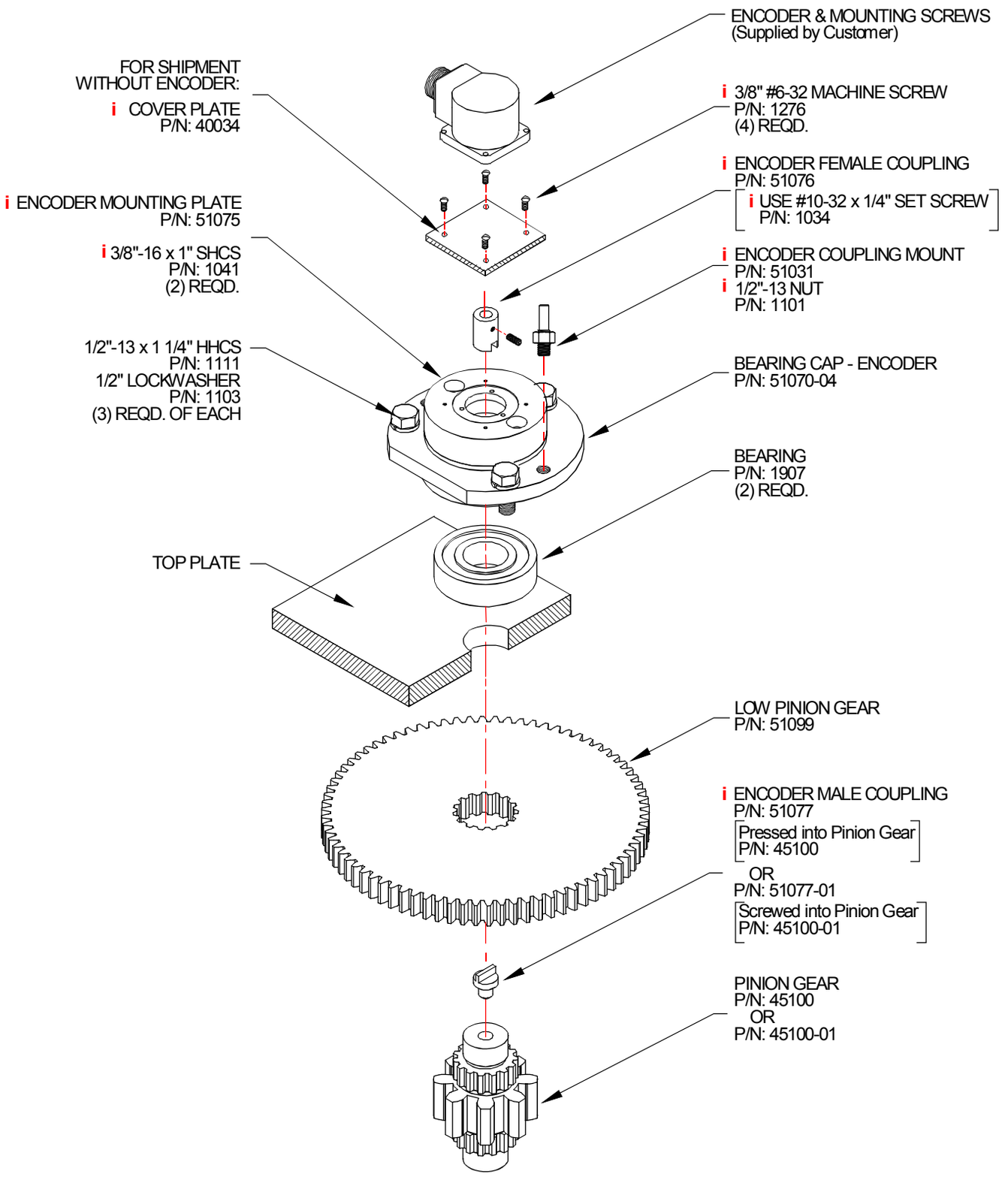
		11/30/00
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\CLES5500\Pinion.wpg



PINION GEAR ASSEMBLY WITH STD. ENCODER

ENCODER ASSEMBLY NO. 51074 i

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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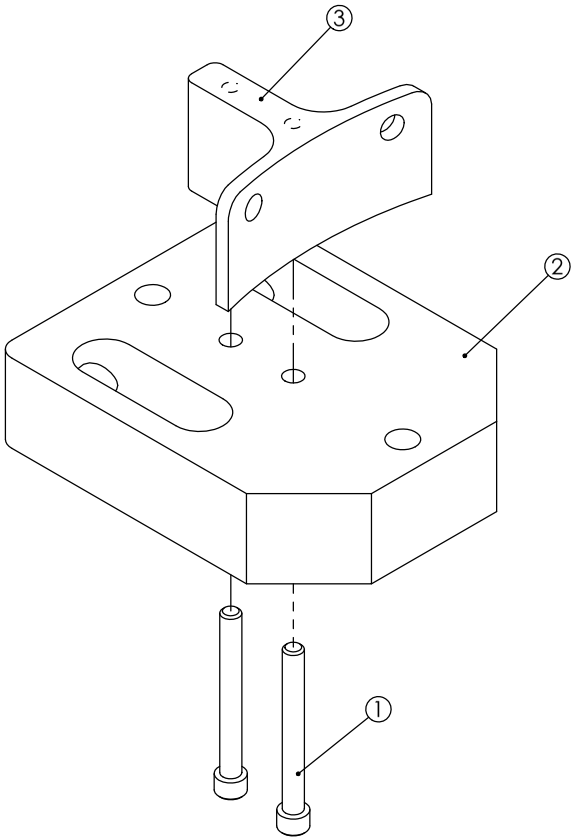
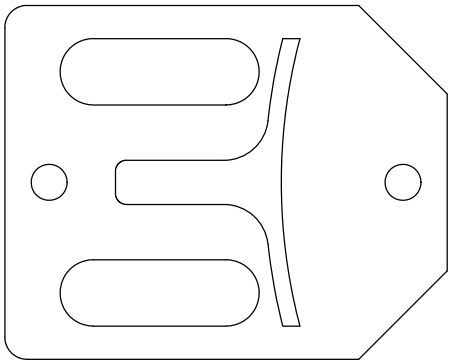
REV. #	LOG #	DATE
2		12/05/00

REF: S:\Equip Manuals-Dwgs\CLJ5500\Pinion w-Encoder rev2.wpg

Item #	Qty.	Part Number	Part Name
1	2	1017	1/4"-20 X 2 1/4" SHCS
2	1	76101BJ-02	TURNS ENCODER MOUNT BASE PLATE
3	1	76101BJ-03	TURNS ENCODER MOUNT TOP PLATE





APPROX.WEIGHT (lbs.) = 2

Rev.#	By	Log#	Description of Revision
6			
5			
4			
3			
2			
1			

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE

2 PLACE DEC.	3 PLACE DEC.	FRACTIONS	ANGLES	SURFACE	FLATNESS AR P.L.
±.020	±.005	± 1/16	± .5°	250	± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

Third angle projection

SUPERIOR Manufacturing & Hydraulics
4225 HWY.90 E
BROUSSARD, LA. 75018
PH: 337-837-8847
FAX: 337-837-8839

PART NAME: TURNS ENCODER MOUNT ASSEMBLY

PART #: 76103BJ

DRAWN BY: Rizal Masingkan

APPROVED BY: DSB | CHK BY: MFG

DATE: 9/15/2008

SHEET 1 of 1 1:2

MATERIAL SPECIFICATION

Matl.Req:

Initial Condition:

Alternate Matl:

H.T Instructions: Case Depth:

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=Revision No. X =STAMP,ETCH,TAG =Machine Zero

1.000 = Critical Dimension 100% Inspection Required

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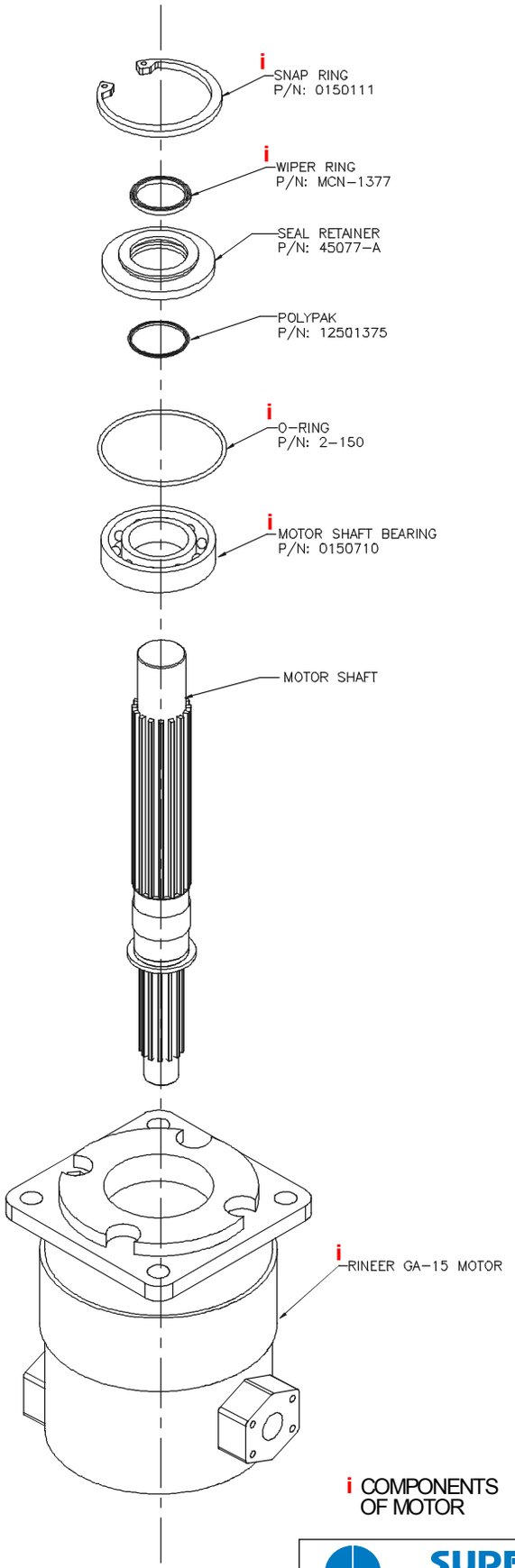
X TAG / LABEL P/N & MATL. P.O. | ETCH P/N & MATL. P.O. ON NON-CRITICAL SURFACE | 1/8 LS STAMP P/N & MATL. P.O. ON NON-CRITICAL SURFACE



i COMPONENTS OF MOTOR

MOTOR ASSEMBLY

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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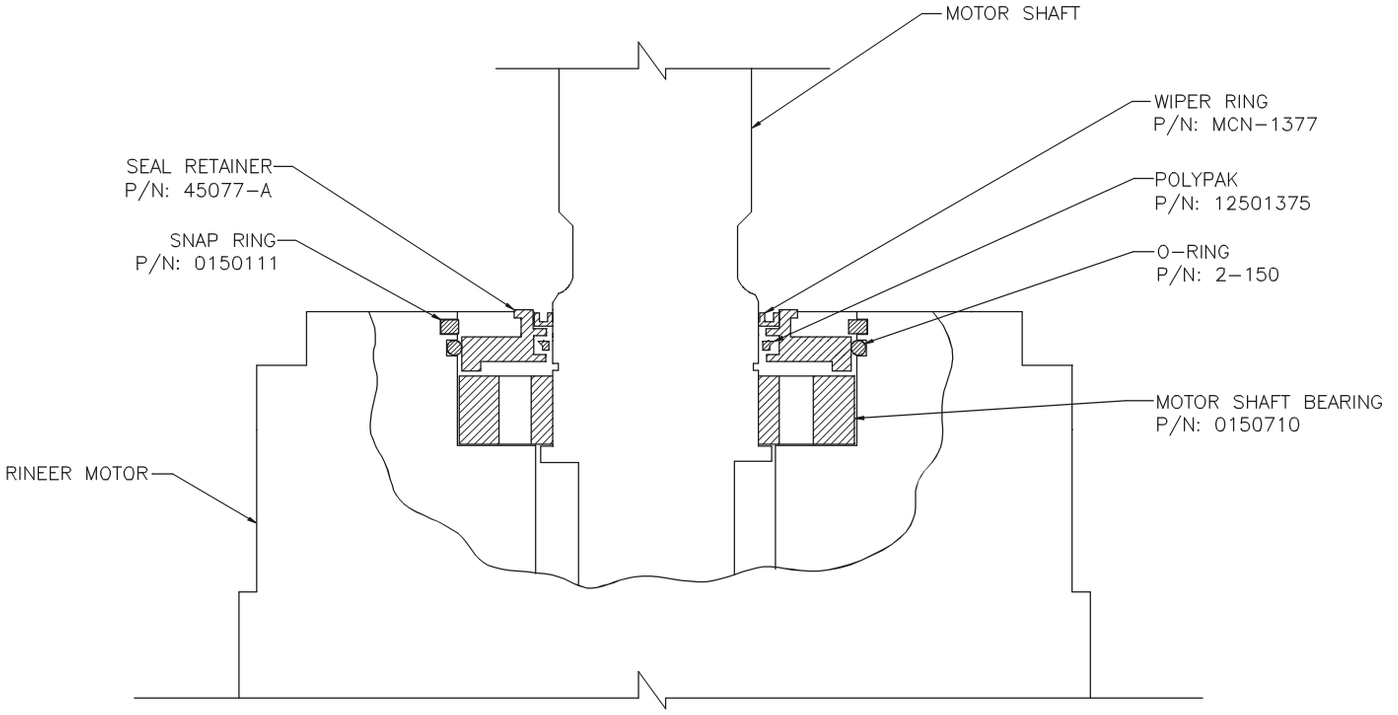
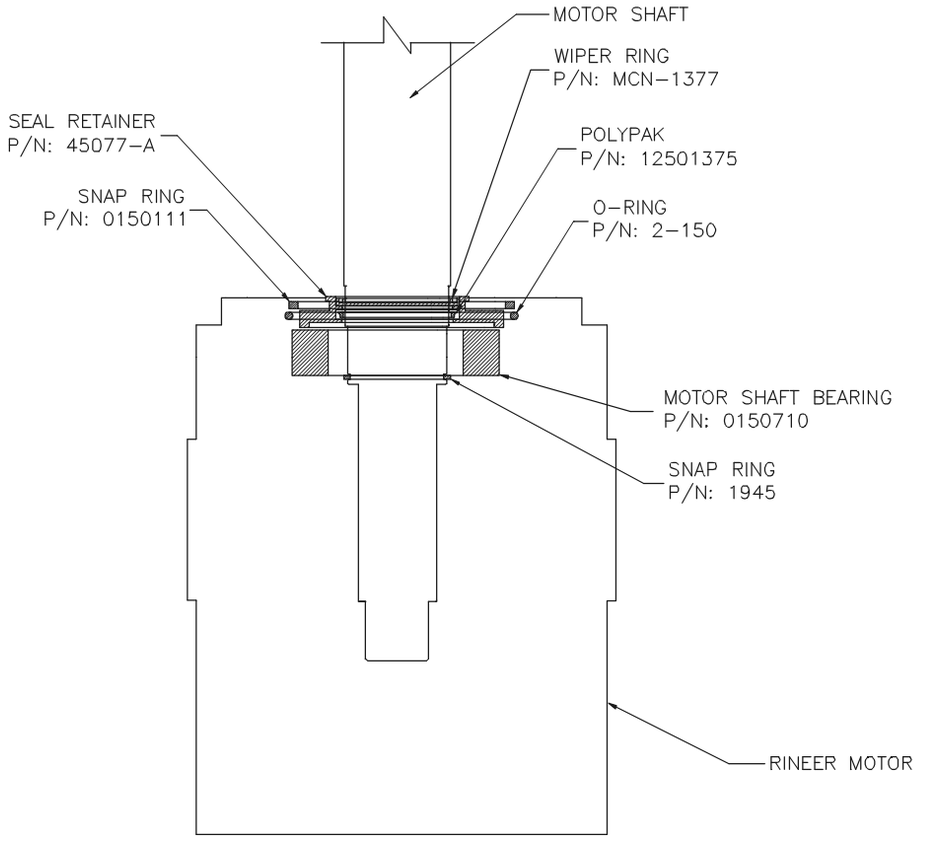
		06/07/02
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\Motor
Motor CLE4500 CLES5500 CLJ5500 sht1.wpg





WITH WIPER RING

MOTOR ASSEMBLY

FOR CLARITY PURPOSE ONLY
NOT TO SCALE

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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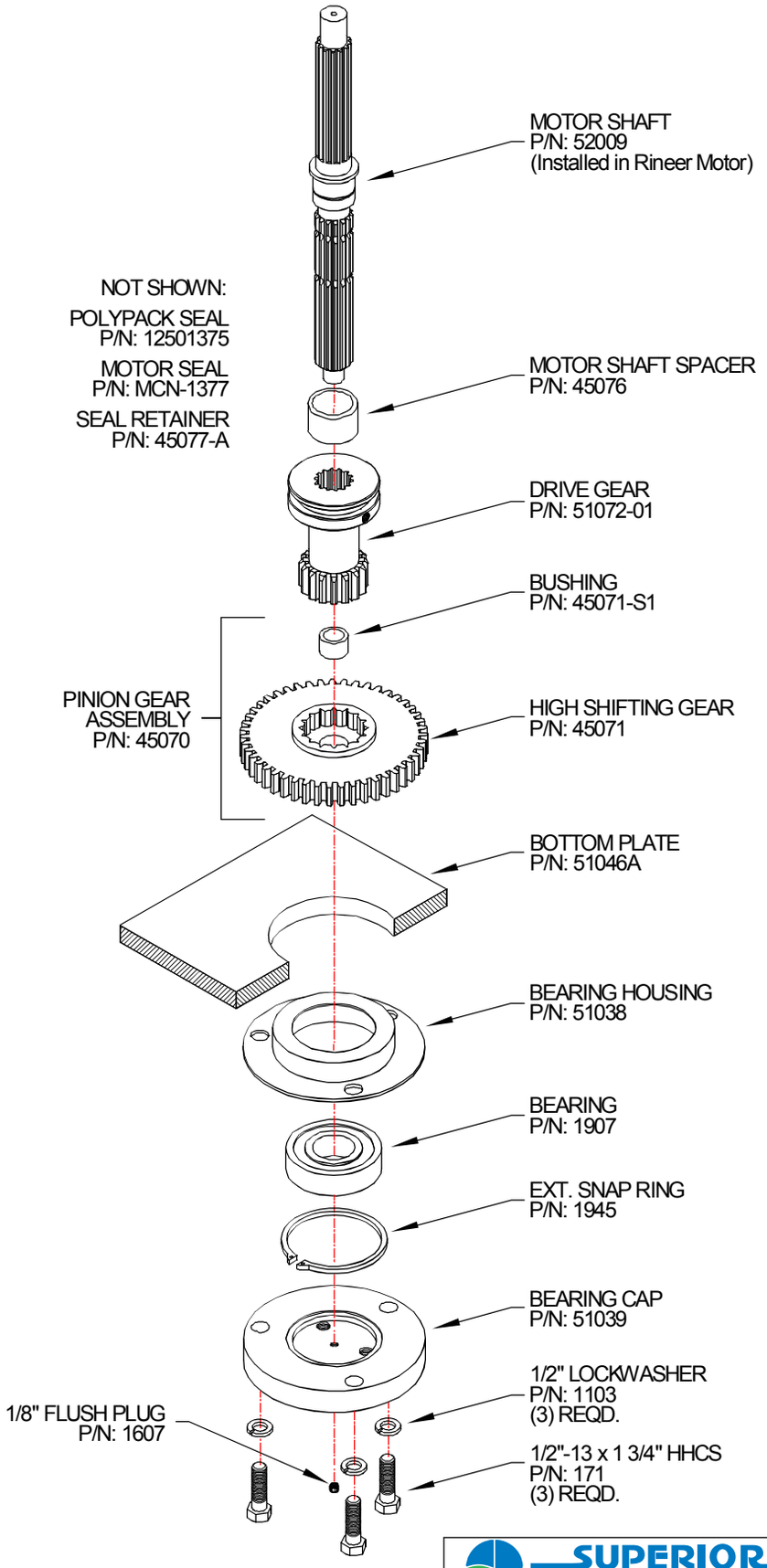
		06/07/02
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\Motor
Motor CLE4500 CLES5500 CLJ5500 sht2.wpg



MOTOR GEAR ASSEMBLY

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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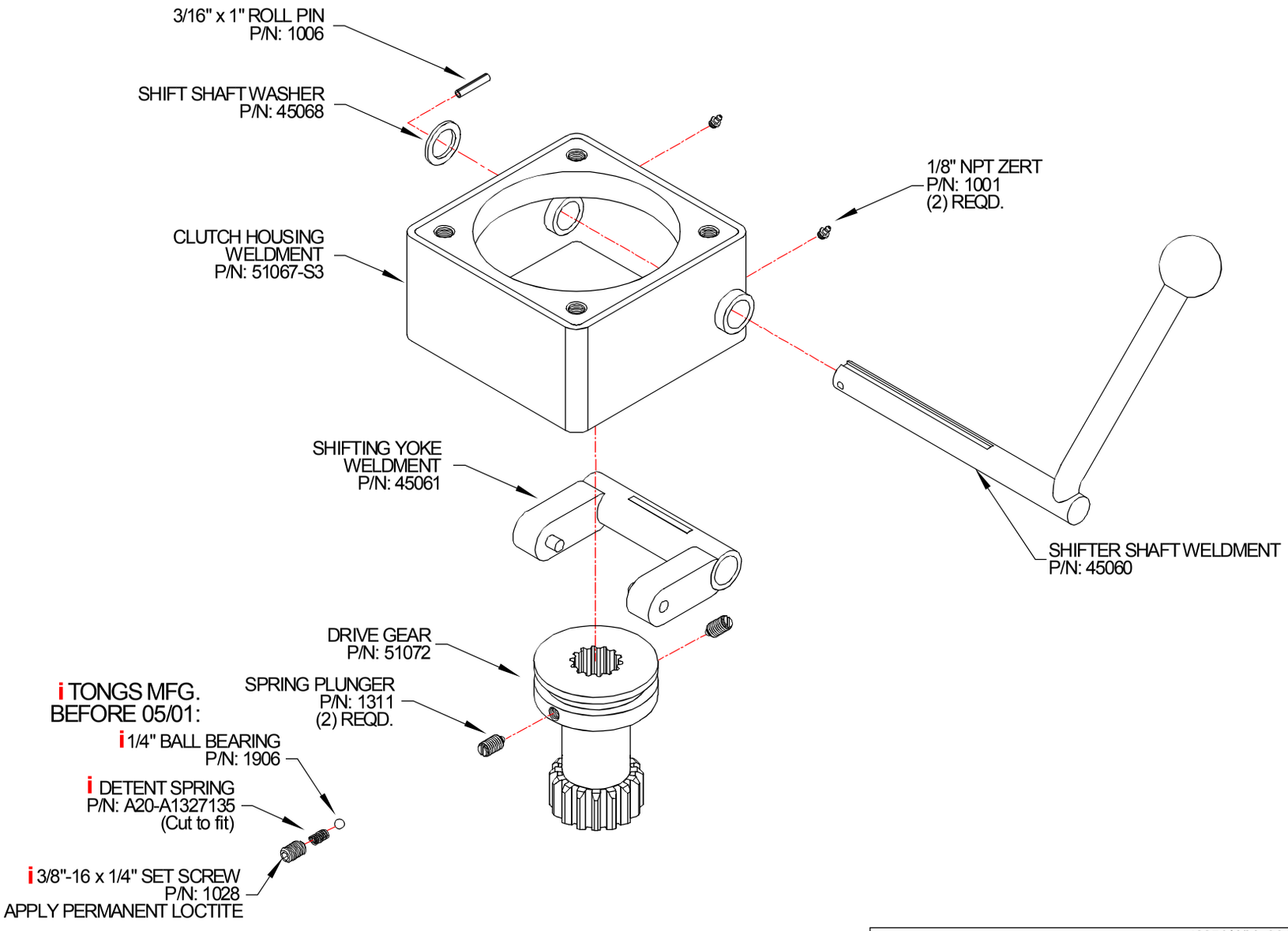
		10/24/03
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\CLES5500HT\Motor Gear.wpg



SHIFT BOX ASSEMBLY

1st GENERATION

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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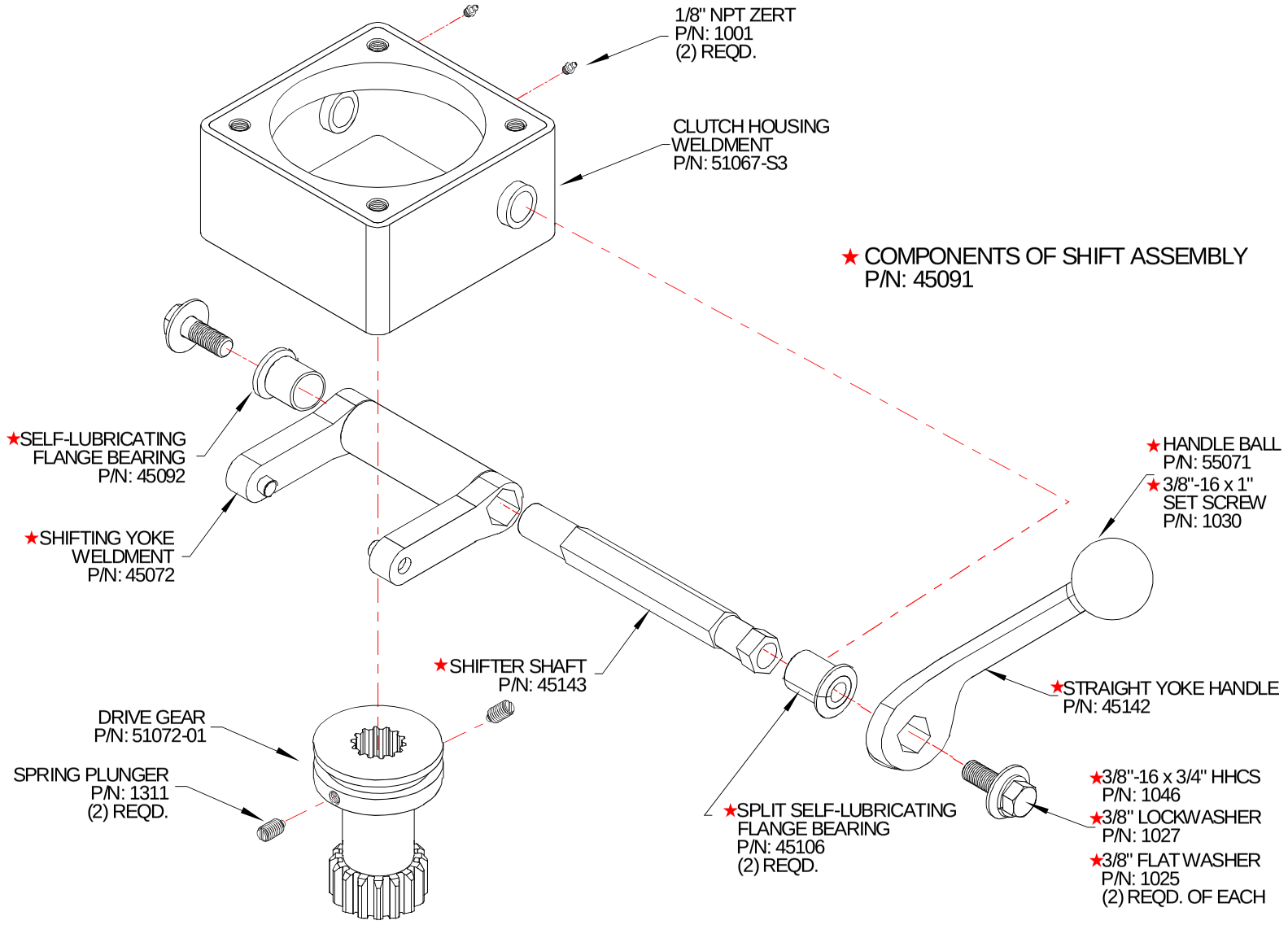
REV. #	LOG #	DATE
2		10/24/03

REF: S:\Equip Manuals\Dwgs\CLES5500\Shift Box rev2.wpg



SHIFT BOX ASSEMBLY

2ND GENERATION

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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REV. #	LOG #	DATE
1		10/24/03

REF: P:\Manuals\Equip Manuals\Dwgs\CLES5500\Shift Box 2 rev1.wpg

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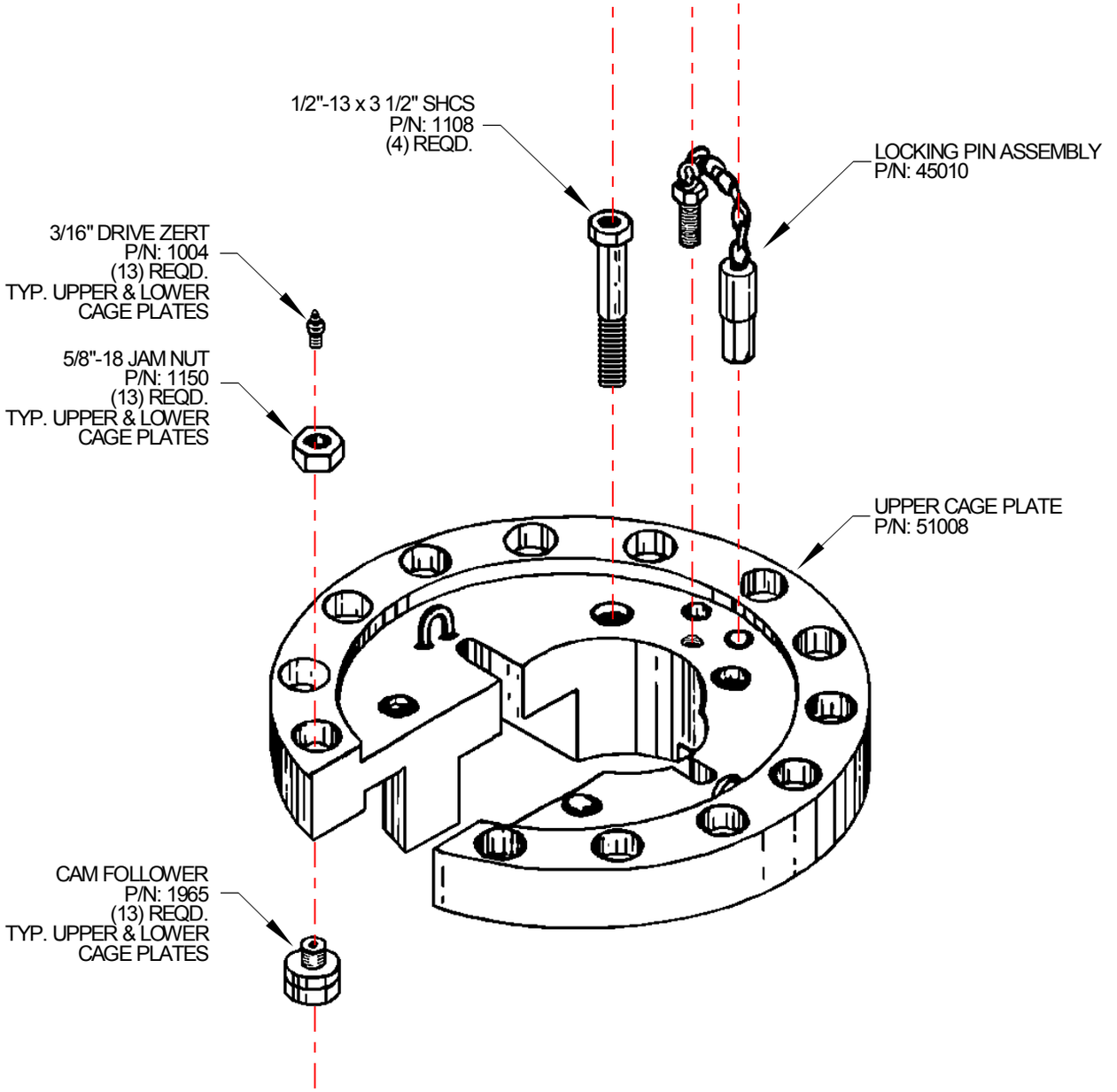

UPPER CAGE PLATE ASSEMBLY

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		10/25/00
REV. #	LOG #	DATE

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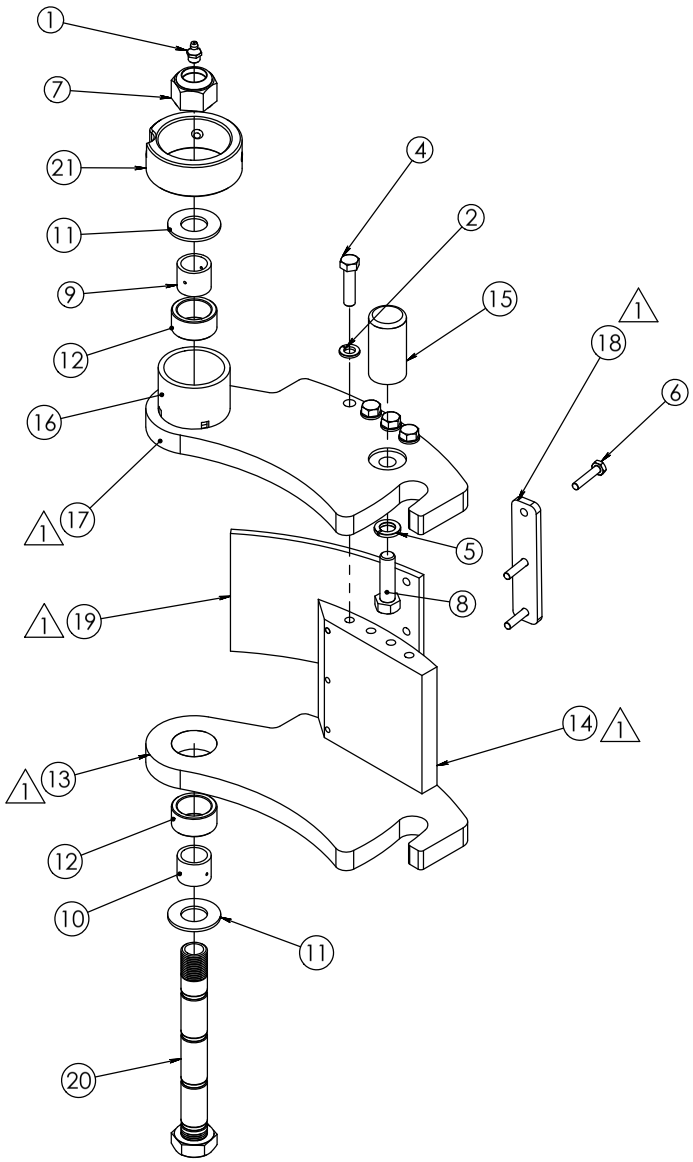

Item #	Qty.	Part Number	Part Name
1	1	1001	1/8 NPT ZERT
2	8	1027	WASHER, LOCK 3/8"
3	2	1029	3/8"-16 X 1/2" SET SCREW
4	8	1049	3/8"-16 X 1 1/2" HHCS
5	1	1103	1/2" LOCKWASHER
6	3	106	1/4"-20 X 1 1/4" HHCS GR8
7	1	1177	7/8"-14 NYLOCK NUT
8	1	171	1/2"-13 x 1 3/4" HHCS
9	1	1955-A	DOOR BUSHING
10	1	1955-B	DOOR BUSHING
11	2	45025	DOOR WASHER
12	2	51036	DOOR BUSHING
13	1	51037	BOTTOM TONG DOOR PLATE
14	1	51040-01	TONG DOOR UPRIGHT
15	1	51041	DOOR HANDLE
16	1	51042	DOOR SWITCH COLLAR
17	1	51043	TOP TONG DOOR PLATE
18	1	51051-S1	SUPPORT STRIP
19	1	51051-S2	DOOR FLAP
20	1	58209	DOOR SHAFT WELDMENT
21	1	76131	DOOR SWITCH ADJ. SLEEVE

APPROX.WEIGHT (lbs.) = 29

Rev.#	By	Log#	Description of Revision
6			
5			
4			
3			
2			
1	RM	ECN08-0445	REFER TO ECN08-0445 COPY

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE

2 PLACE DEC.	3 PLACE DEC.	FRACTIONS	ANGLES	SURFACE	FLATNESS AR PL.
±.020	±.005	± 1/16	± .5°	250	± .015 per foot

1. Dimensions are in inches
2. Remove burs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

Third angle projection

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△ ⬡ =Revision No. (X) =STAMP,ETCH,TAG ⊕ =Machine Zero

1.000 = Critical Dimension 100% Inspection Required

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4225 HWY.90 E
BROUSSARD, LA. 75018
PH: 337-837-8847
FAX: 337-837-8839

PART NAME: INTEGRATED DOOR ASSEMBLY

PART #: 51051 △1

DRAWN BY: Rizal Masingkan

APPROVED BY: DSB CHK BY: MFG

DATE: 9/26/2008

SHEET 1 of 1 1:6

MATERIAL SPECIFICATION

Matl.Req:

Initial Condition:

Alternate Matl:

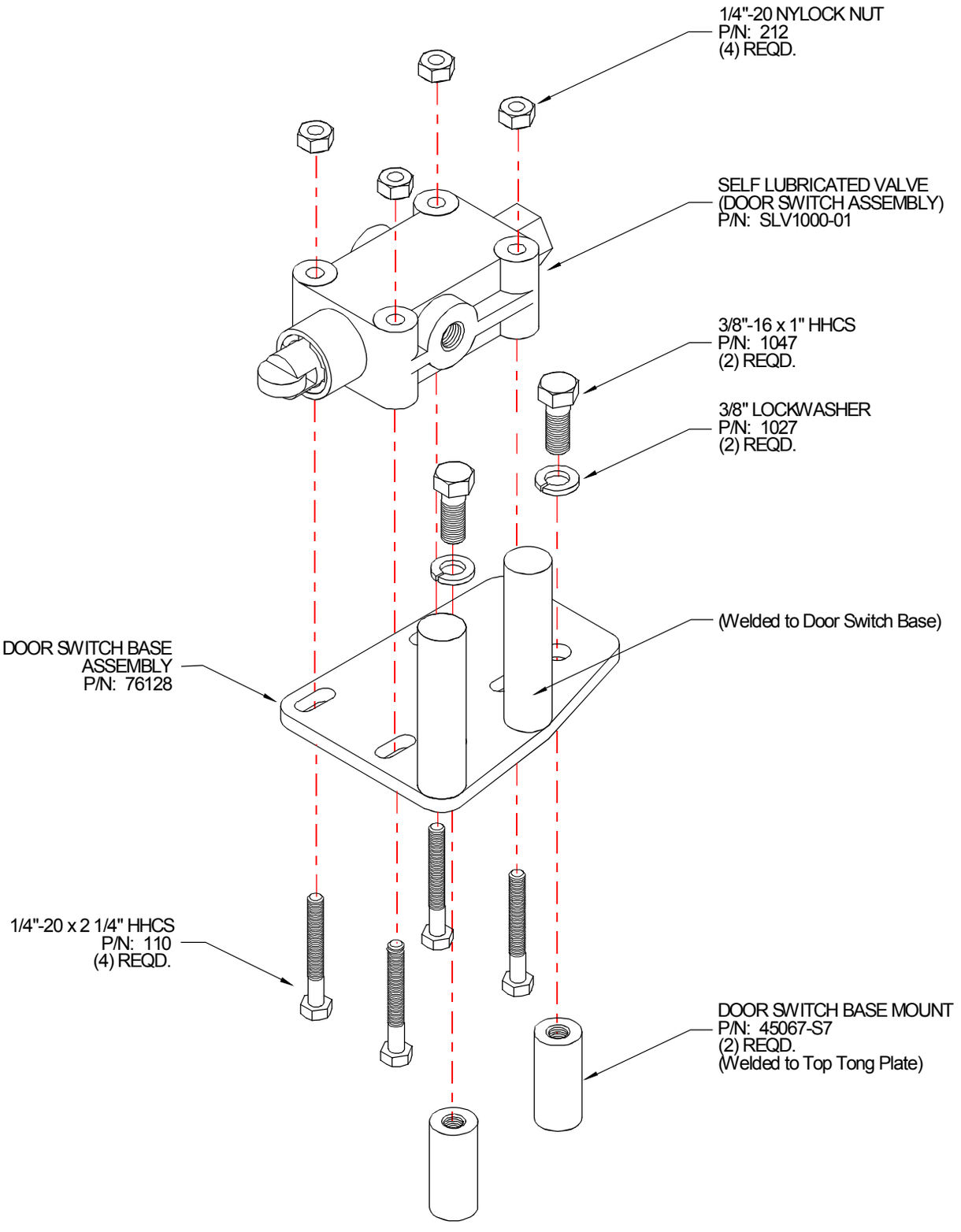
H.T Instructions: Case Depth:

X TAG / LABEL P/N & MATL. P.O.

ETCH P/N & MATL. P.O. ON NON-CRITICAL SURFACE

1/8 LS STAMP P/N & MATL. P.O. ON NON-CRITICAL SURFACE

SolidWorks document Printed on Friday, December 12, 2008 CAD File Location: P:\Engineering\Parts\5\



DOOR SWITCH ASSEMBLY

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(318) 837-8847

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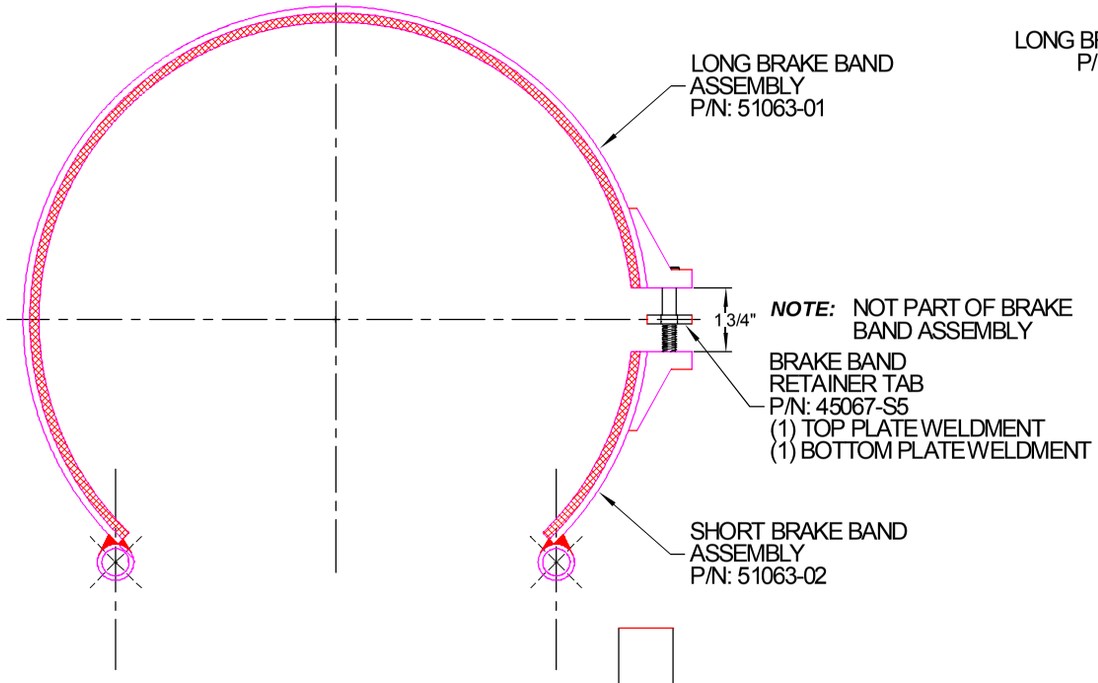
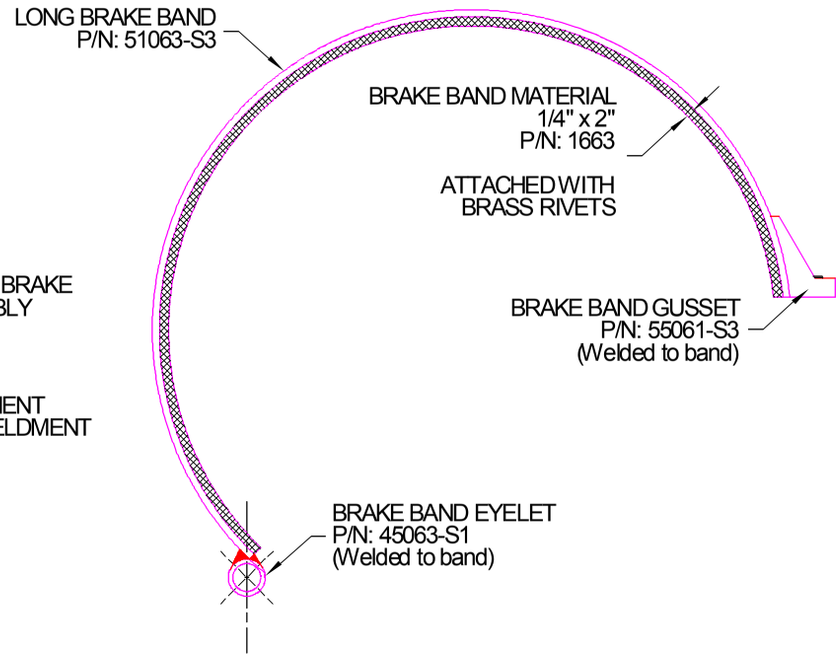
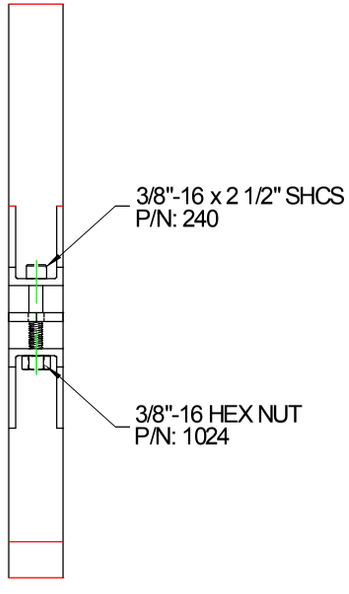
		06/22/00
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\Door Switch Assy.wpg



LONG BRAKE BAND ASSEMBLY
ASSEMBLY NO. 51063-01

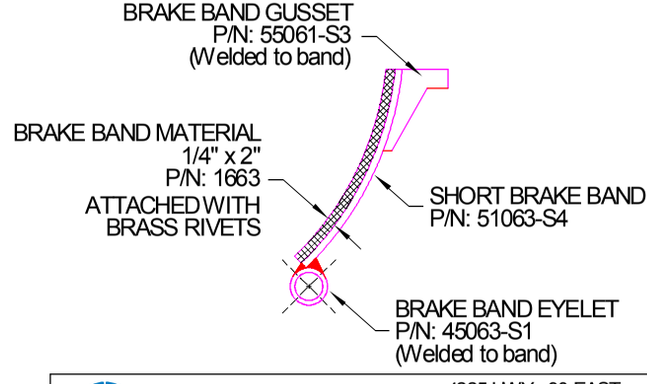




NOTE: CAP SCREW & NUT ARE NOT PART OF BRAKE BAND ASSEMBLY. THEY ARE PART OF TONG ASSY.

NOTE: CAP SCREW AND NUT ARE SHOWN AS BOTTOM VIEW, REVERSE FOR TOP BRAKE BAND.

SHORT BRAKE BAND ASSEMBLY
ASSEMBLY NO. 51063-02



BRAKE BAND ASSEMBLY

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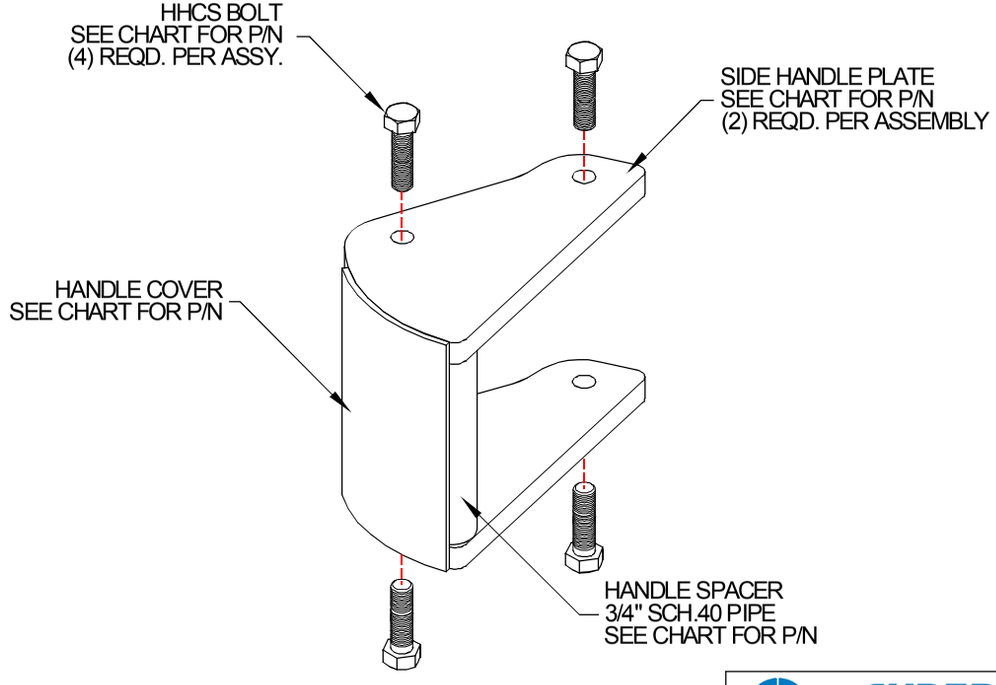
		10/31/00
REV. #	LOG #	DATE

REF: S:\Equip Manuals\Dwgs\CLES5500\Brake Band Assy.wpg

TONG	ASSEMBLY NUMBER	HANDLE SPACER PIPE PART NO.	HANDLE COVER PLATE PART NO.	SIDE HANDLE PLATE PART NO.	HHCS BOLT	
					PART NO.	SIZE
4 1/2 STANDARD	41111	41111-S1	41111-S2	45121	1055	3/8"-16 x 2 1/4"
5 1/2 STANDARD	51111	51111-S1	51111-S2	45119	1055	3/8"-16 x 2 1/4"
5 1/2 LOCKJAW	58086	51111-S1	51111-S2	45121	1055	3/8"-16 x 2 1/4"
5 1/2 UHT & XHT	55141	73017-S1	55141-S2	55200	201	5/8"-11 x 2 1/4"
5 1/2 XHT01	59067	73017-S1	73017-S2	59067-S1	201	5/8"-11 x 2 1/4"
7 5/8 STANDARD	76133	73017-S1	55141-S2	55200	201	5/8"-11 x 2 1/4"
7 5/8 DRILL PIPE -35	73017	73017-S1	73017-S2	14035	201	5/8"-11 x 2 1/4"
7 5/8 LOCKJAW	(2) 73095	73095-S1	73095-S2	14035-01	201	5/8"-11 x 2 1/4"
7 5/8 & 8 5/8 DRILL PIPE -60 & -03	(1) 74095	73095-S1	73095-S2	14035-02	201	5/8"-11 x 2 1/4"



SIDE HANDLE ASSEMBLY

SEE CHART FOR ASSEMBLY NUMBER

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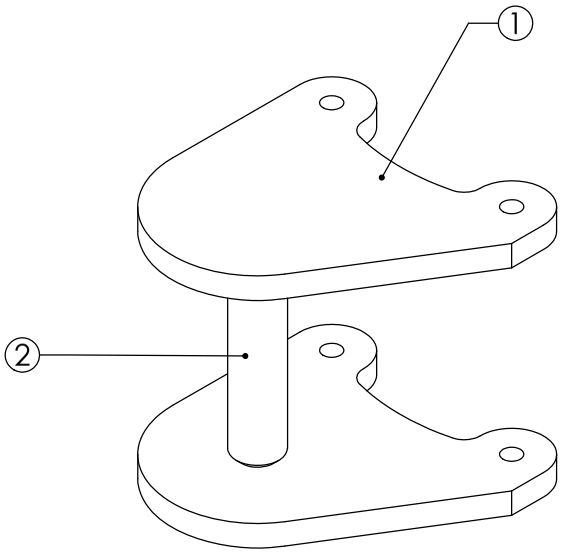
REV. #	LOG #	DATE
6		10/24/03

REF: S:\Equip Manuals-Dwgs\ILL1087 Side Hdle Assy rev6.wpg

Item #	Qty.	Part Number	Part Name	Material
1	2	51113-S1	SIDE HANDLE WELDMENT #1	A-36
2	1	51113-S2	SIDE HANDLE WELDMENT #2	1018



APPROX.WEIGHT (lbs.) = 7

Rev.#	By	Log#	Description of Revision
6			
5			
4			
3			
2			
1			

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE

2 PLACE DEC.	3 PLACE DEC.	FRACTIONS	ANGLES	SURFACE	FLATNESS AR PL.
±.020	±.005	± 1/16	± .5°	250	± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

Third angle projection

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4225 HWY.90 E
BROUSSARD, LA. 75018
PH: 337-837-8847
FAX: 337-837-8839

PART NAME: SIDE HANDLE WELDMENT

PART #: 51113

DRAWN BY: Rizal Masingkan

APPROVED BY: DSB | CHK BY: MFG

DATE: 9/26/2008

SHEET 1 of 1 | 1:4

MATERIAL SPECIFICATION

Matl.Req:

Initial Condition:

Alternate Matl:

H.T Instructions: Case Depth:

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=Revision No. (X) =STAMP,ETCH,TAG =Machine Zero

1.000 = Critical Dimension 100% Inspection Required

SolidWorks document Printed on Tuesday, December 02, 2008 CAD File Location: P:\Engineering\Parts\5\

X TAG / LABEL P/N & MATL. P.O.

ETCH P/N & MATL. P.O. ON NON-CRITICAL SURFACE

1/8 LS STAMP P/N & MATL. P.O. ON NON-CRITICAL SURFACE

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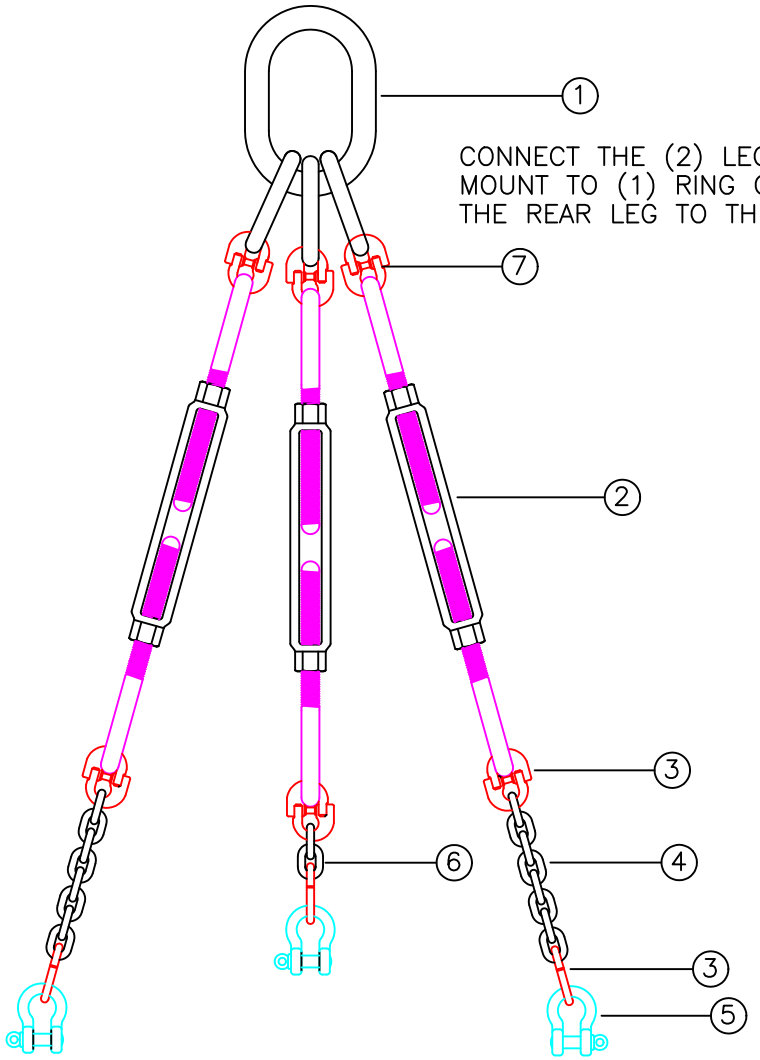
Item No.	Qty.req. /unit	Description	Part No.
1	1	Crosby Master Link Assy.	45103–C ⟨4⟩
2	3	3/4x6 Eye to Eye Turnbuckle ⟨2⟩	55001–02
3	9	5/16 Connecting Link ⟨2⟩	40027–S3
4	2	5/16 Chain Links (8 links)	
5	3	1/2 Shackle ⟨1⟩	40027–S4A
6	1	5/16 Chain Links (2 links)	
7	3	3/8 CONNECTING LINK	40027–S3B



Rev.#	By	Log#	Description of Revision
6			
5			
4			
3			
2			
1			

X 1/8 LS STAMP P/N & W.O ON NON–CRITICAL SURFACE

ETCH P/N & W.O ON NON–CRITICAL SURFACE

TAG P/N & W.O

UNLESS OTHERWISE SPECIFIED TOLERANCES ARE — R6

2 PLACE DEC. ±.020	3 PLACE DEC. ±.005	FRACTIONS ± 1/16	ANGLES ± .5°	SURFACE 250	FLATNESS AR PL. ± .015 per foot

1. Dimensions are in inches
2. Remove burrs & sharp edges with 1/64x45°max.
3. Machined fillet radii are 1/32
4. Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.
5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.R

⟨1⟩=Revision No. ⊗=STAMP,ETCH,TAG ⊕=Machine Zero

1.000 = Critical Dimension 100% Inspection Required

SHEET 1 of 1

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PART NAME: ILLUSTRATION OF BRIDLE ASSEMBLY CLE5500–15E

PART #: 55001–04

DRAWN BY: L. CHILDRESS

APPROVED BY: DAN B

CHK BY: NM DATE: 06–09–04

REF: F:\DWG\55001–04.DWG

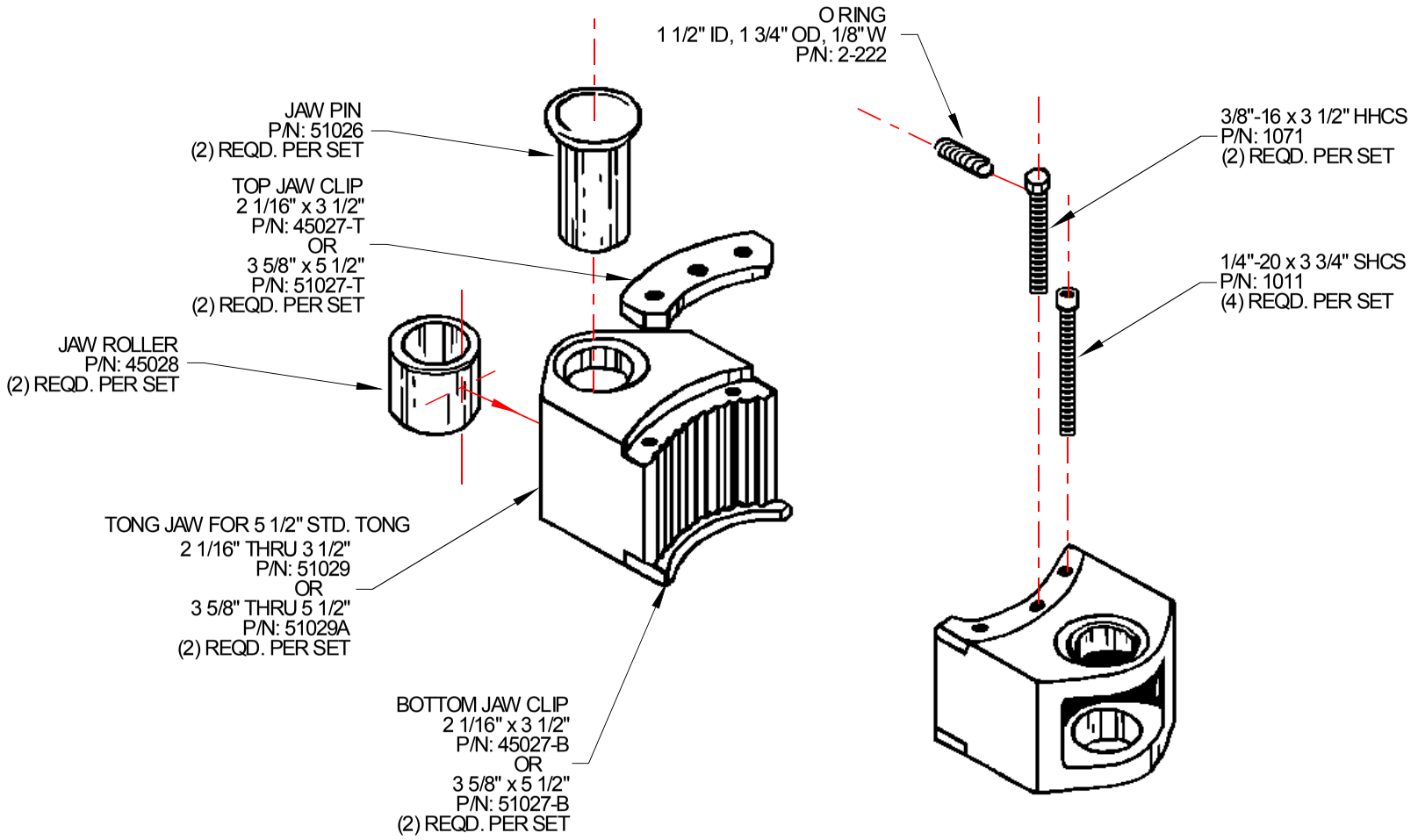
MATERIAL SPECIFICATION

Matl.Req: SEE PRINT

Initial Condition:

Alternate Matl:

H.T Instructions: Case Depth:



5 1/2" STANDARD TONG JAW ASSEMBLY

2 1/16" - 3 1/2" ASSEMBLY NO. CJ-51A
3 5/8" - 5 1/2" ASSEMBLY NO. CJ-51B

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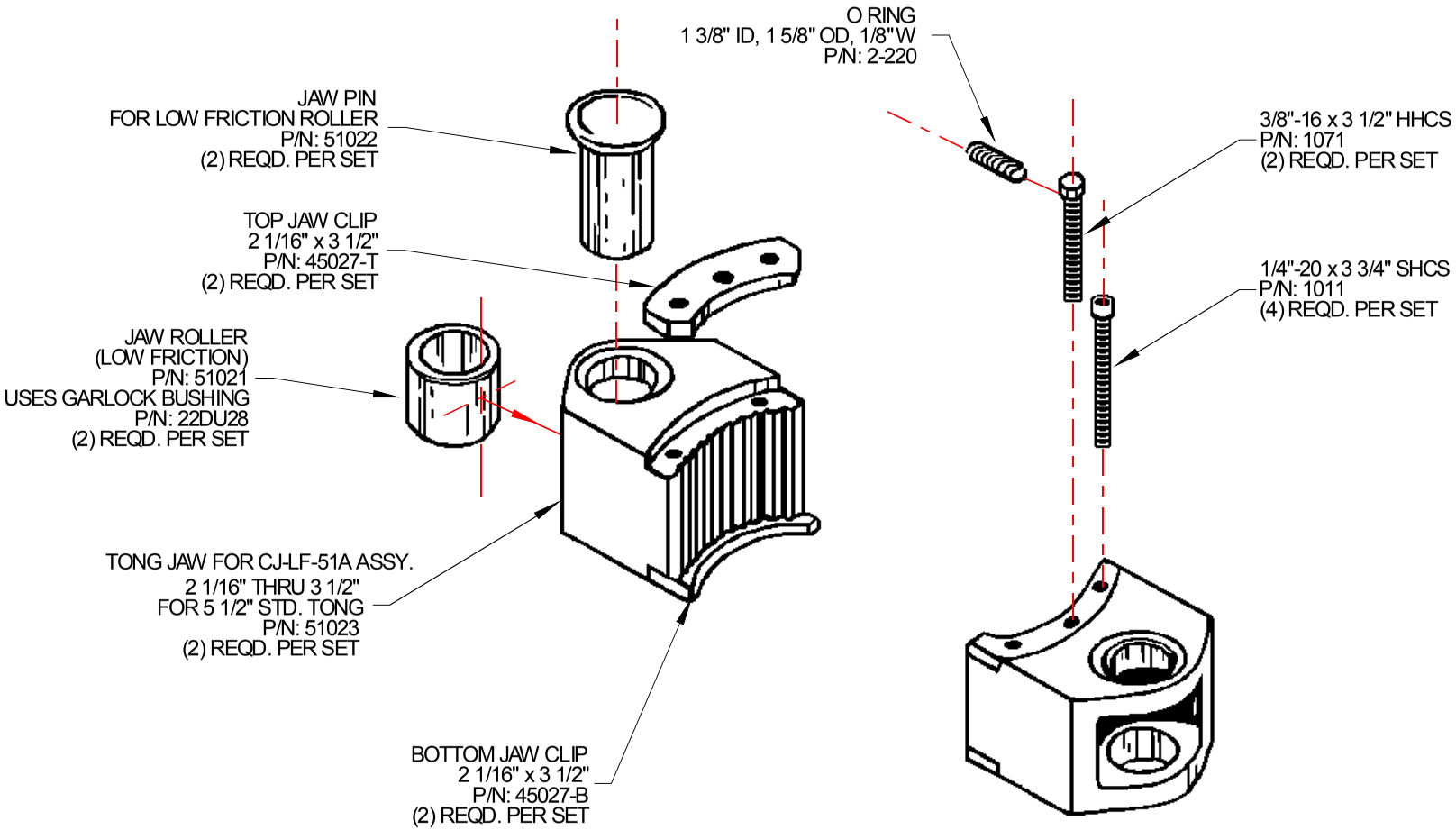
REV. #	LOG #	DATE
		10/25/00

REF: S:\Equip Manuals\Dwgs\CLES5500\Jaw Std.wpg



5 1/2" STANDARD TONG
LOW FRICTION JAW ASSEMBLY

2 1/16" - 3 1/2" ASSEMBLY NO. CJ-LF-51A

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REV. #	LOG #	DATE
		10/25/00

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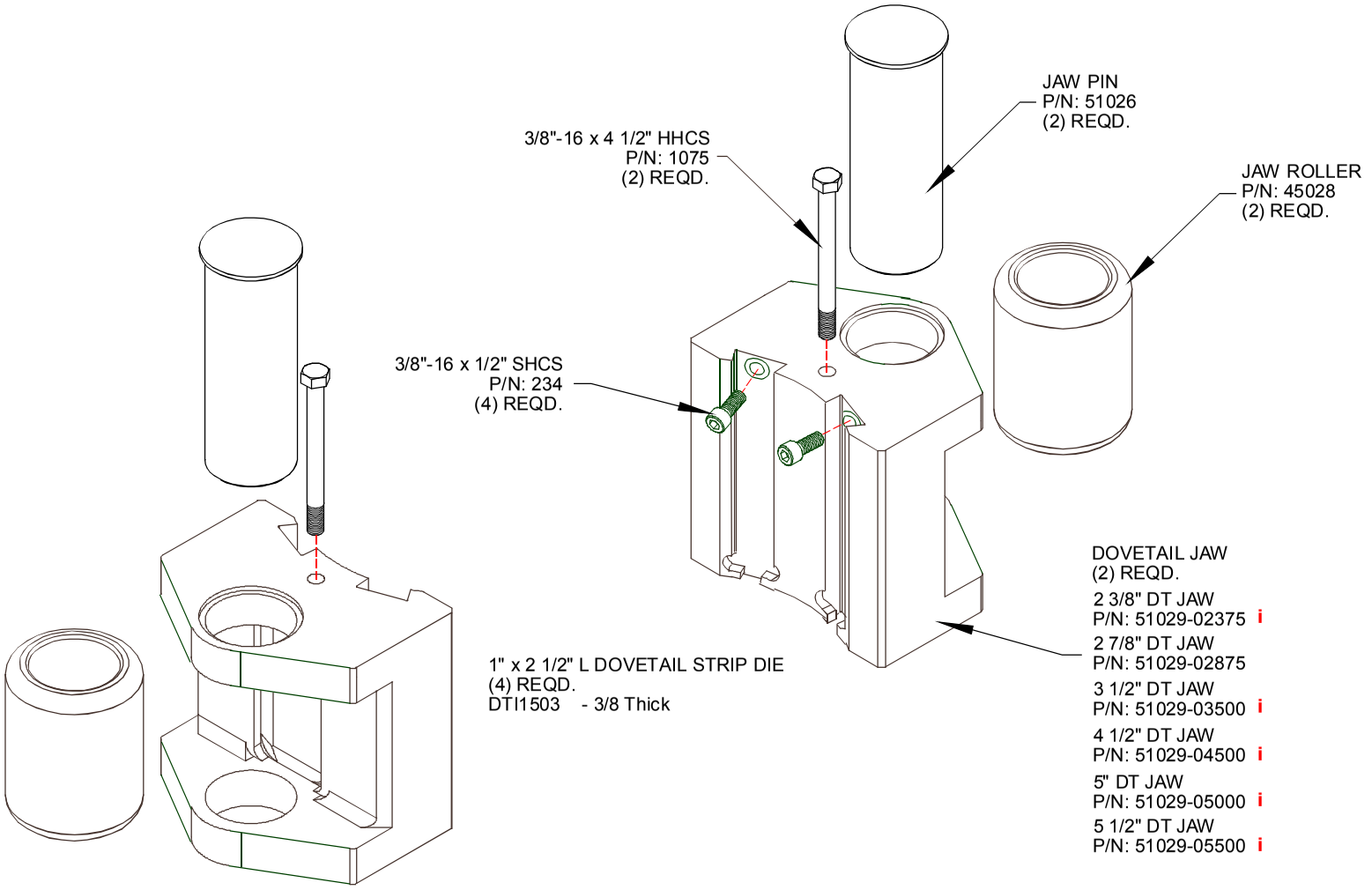

DOVETAIL JAW ASSEMBLY

5 1/2" STD & HT TONG

(Right & Left Jaw are reversible and interchangeable)

2 3/8" Assembly Number CJDT51-02375 i
2 7/8" Assembly Number CJDT51-02875
3 1/2" Assembly Number CJDT51-03500 i
4 1/2" Assembly Number CJDT51-04500 i
5" Assembly Number CJDT51-05000 i
5 1/2" Assembly Number CJDT51-05500 i

i DESIGNED UPON REQUEST

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		07/28/04
REV. #	LOG #	DATE

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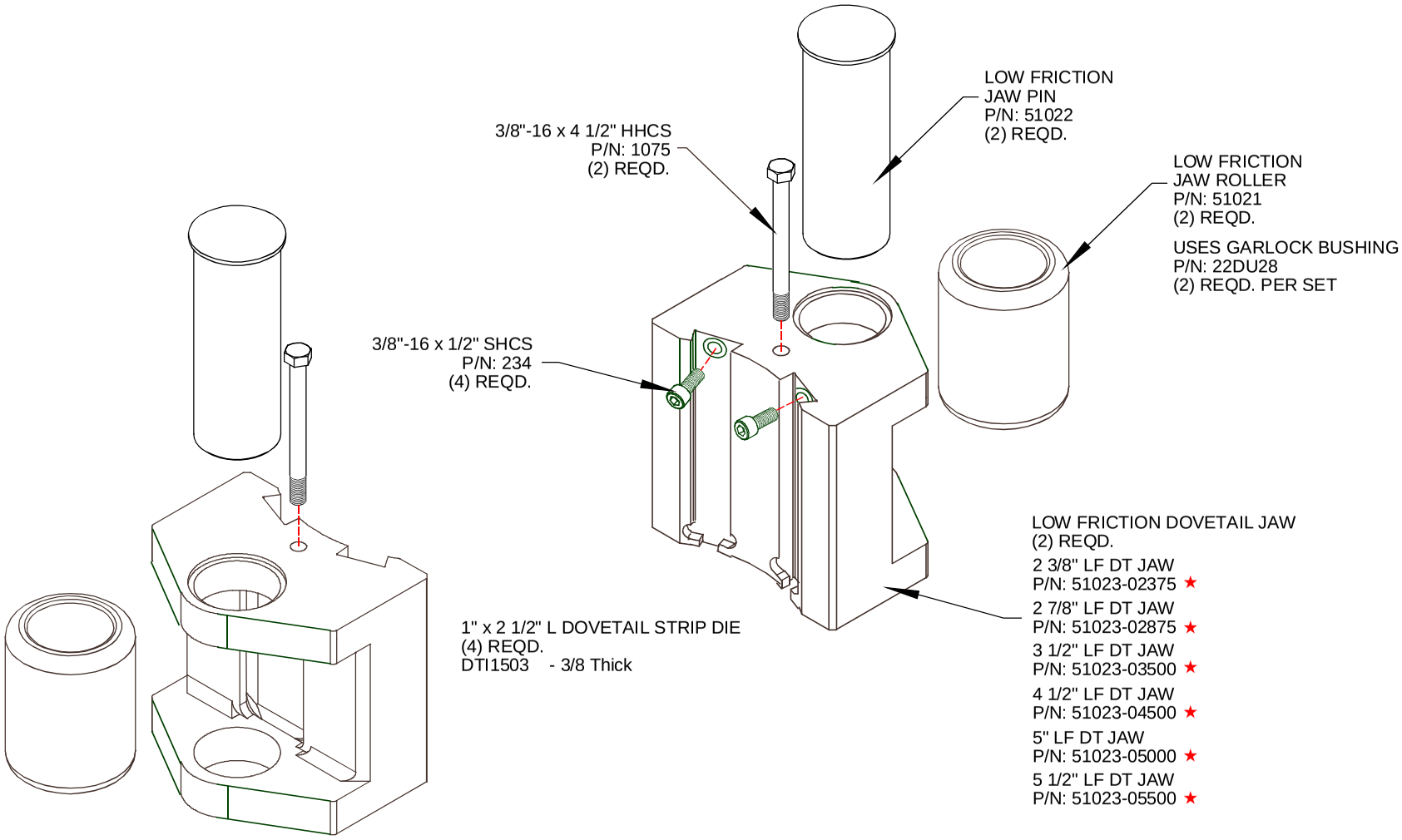

LOW FRICTION
DOVETAIL JAW ASSEMBLY
5 1/2" STD & HT TONG

(Right & Left Jaw are reversible and interchangeable)

2 3/8" Assembly Number CJLFDT51-02375 ★
2 7/8" Assembly Number CJLFDT51-02875 ★
3 1/2" Assembly Number CJLFDT51-03500 ★
4 1/2" Assembly Number CJLFDT51-04500 ★
5" Assembly Number CJLFDT51-05000 ★
5 1/2" Assembly Number CJLFDT51-05500 ★

★ DESIGNED UPON REQUEST

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		07/28/04
REV. #	LOG #	DATE

REF: P:\Manuals\Equip Manuals\Dwgs\CLES5500\Jaw DT LF.wpg

SECTION 10 BACKUP ILLUSTRATIONS

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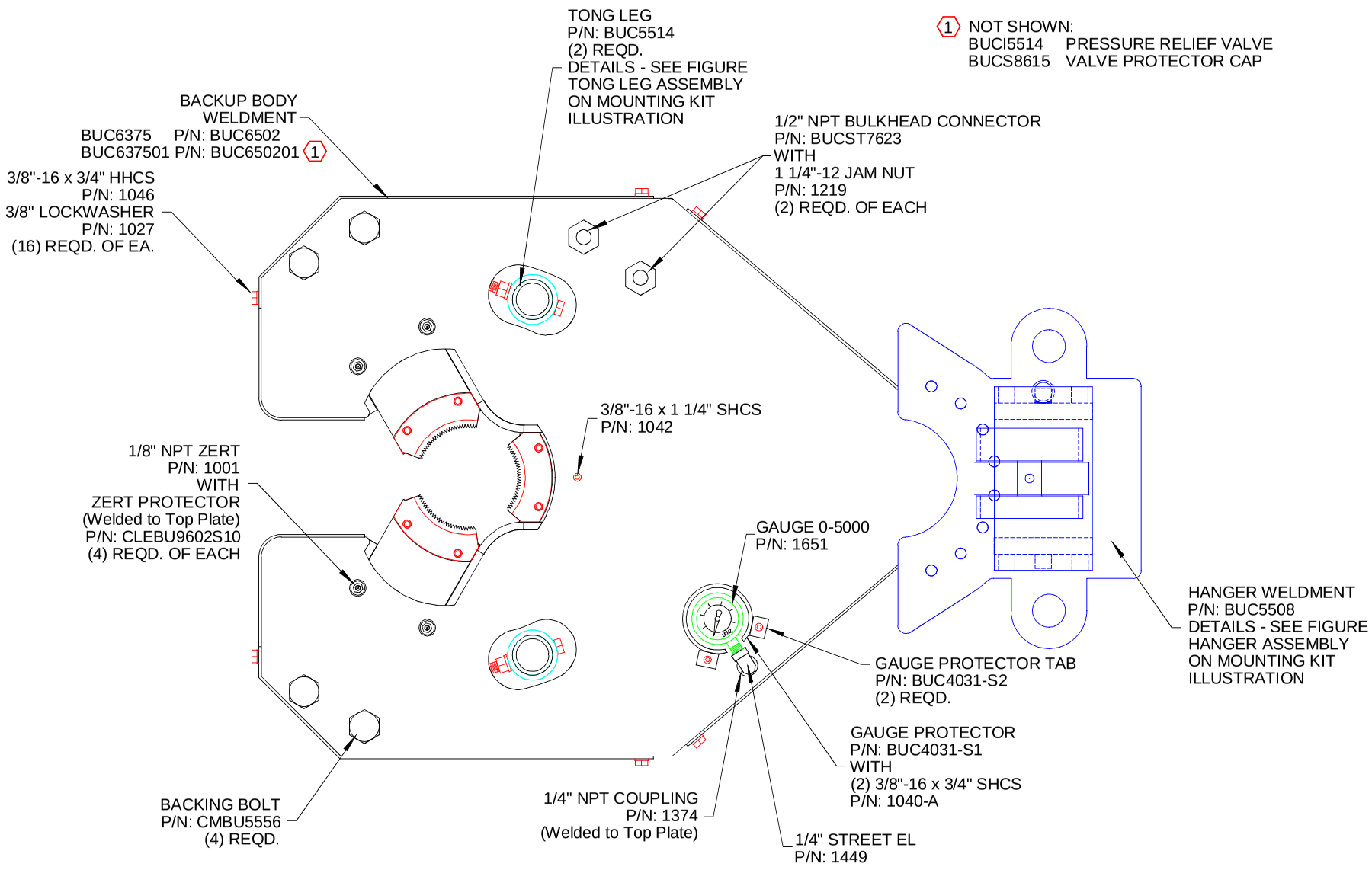

6 3/8" S.H.T. BACKUP
TOP VIEW

Rev.	Date	Description
1	03/27/08	Added information for Backup Model BUC637501.

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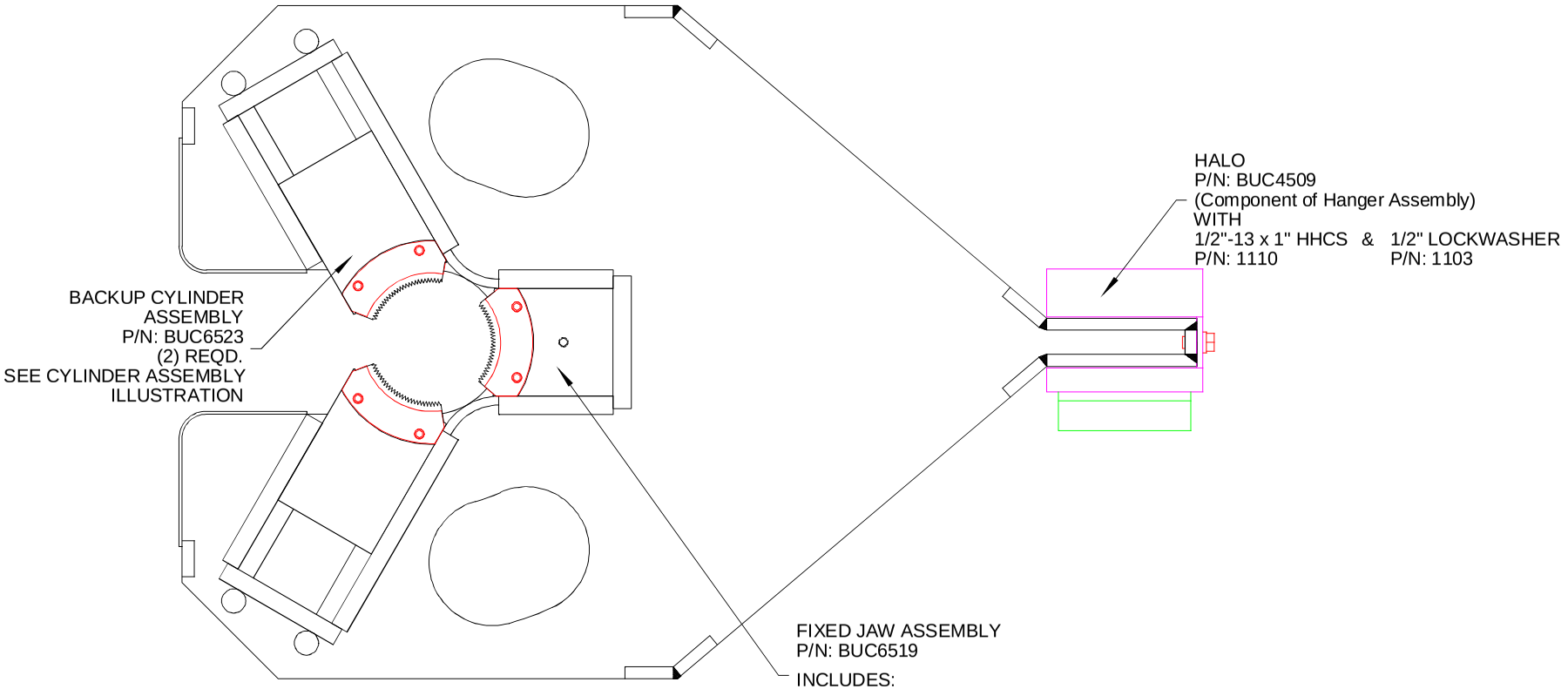
REV. #	LOG #	DATE
1		03/27/08

REF: P:\Manuals\Equip Manuals\Dwgs\BUC6375\Top View rev1.wpg



6 3/8" S.H.T. BACKUP
TOP VIEW WITHOUT TOP PLATE

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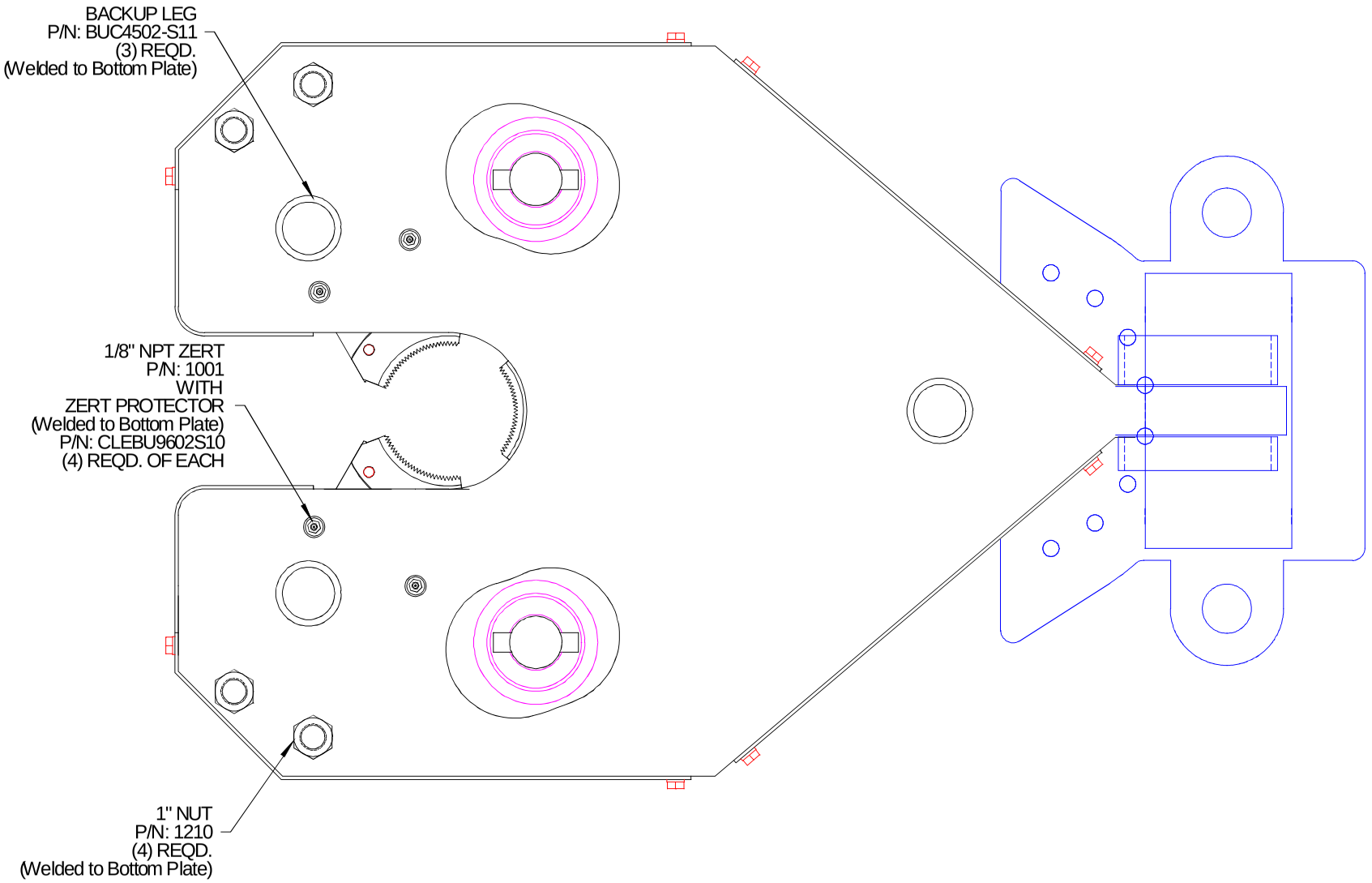
		10/27/03
REV. #	LOG #	DATE

REF: P:\Manuals\Equip Manuals\Dwgs\BUC6375\Top View wo Plate.wpg



6 3/8" S.H.T. BACKUP
BOTTOM VIEW

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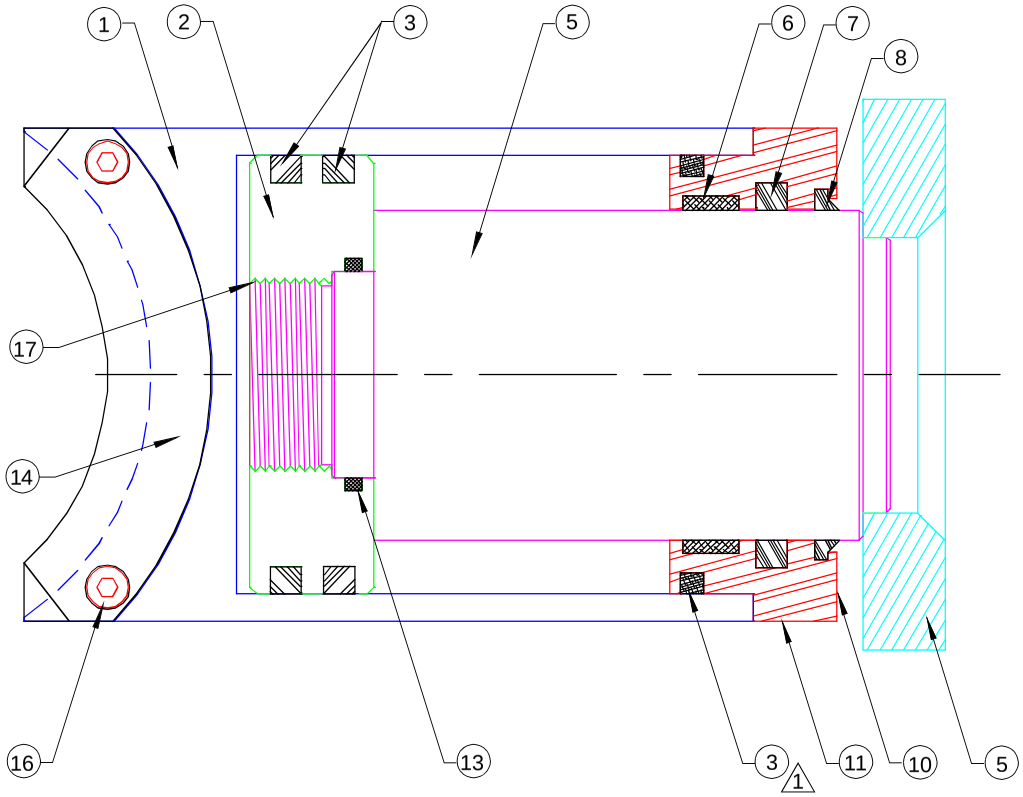
		11/20/01
REV. #	LOG #	DATE

REF: P:\Manuals\Equip Manuals\Dwgs\BUC6375\Bottom View.wpg

★ SEAL KIT NO. ASAP2316

	BILL OF MATERIALS			
	Item	*Qty.*	*P/N*	*Description*
	1	1	BUC6530	Cylinder Housing Weldment
	2	1	CMBU4525	Piston
★	3	3 △1	25004000	Polypack 4" x 4 1/2" x 1/4"
	4	---	-----	-----
	5	1	BUC6504	Rod w/Backing Plate Weldment
★	6	1	W32500500	Wearband
★	7	1	25003000	Polypack 3 x 3 1/2" x 1/4"
★	8	1	959-29	Rod Wiper 3"
	9	---	-----	-----
	10	4	246	1/2"-13 x 1" SHCS
	11	1	CMBU4528	Gland
△1	12	---	----	-----
★	13	1	12501875	Polypack 1 7/8" x 2 1/8" x 1/8"
	14	1	BUC6505	Top Jaw Clip
	15	---	-----	-----
	16	2	1020	1/4"-20 x 4 1/4" SHCS
	17	1	1008-B	1/4"-20 x 1/4" Set Screw



6 3/8" S.H.T. BACKUP CYLINDER ASSEMBLY

ASSEMBLY NO. BUC6523

Rev.	Date	Description
1	06/01/06	Item 3 & 12 - Replaced item 12 with 3 (per Ning).

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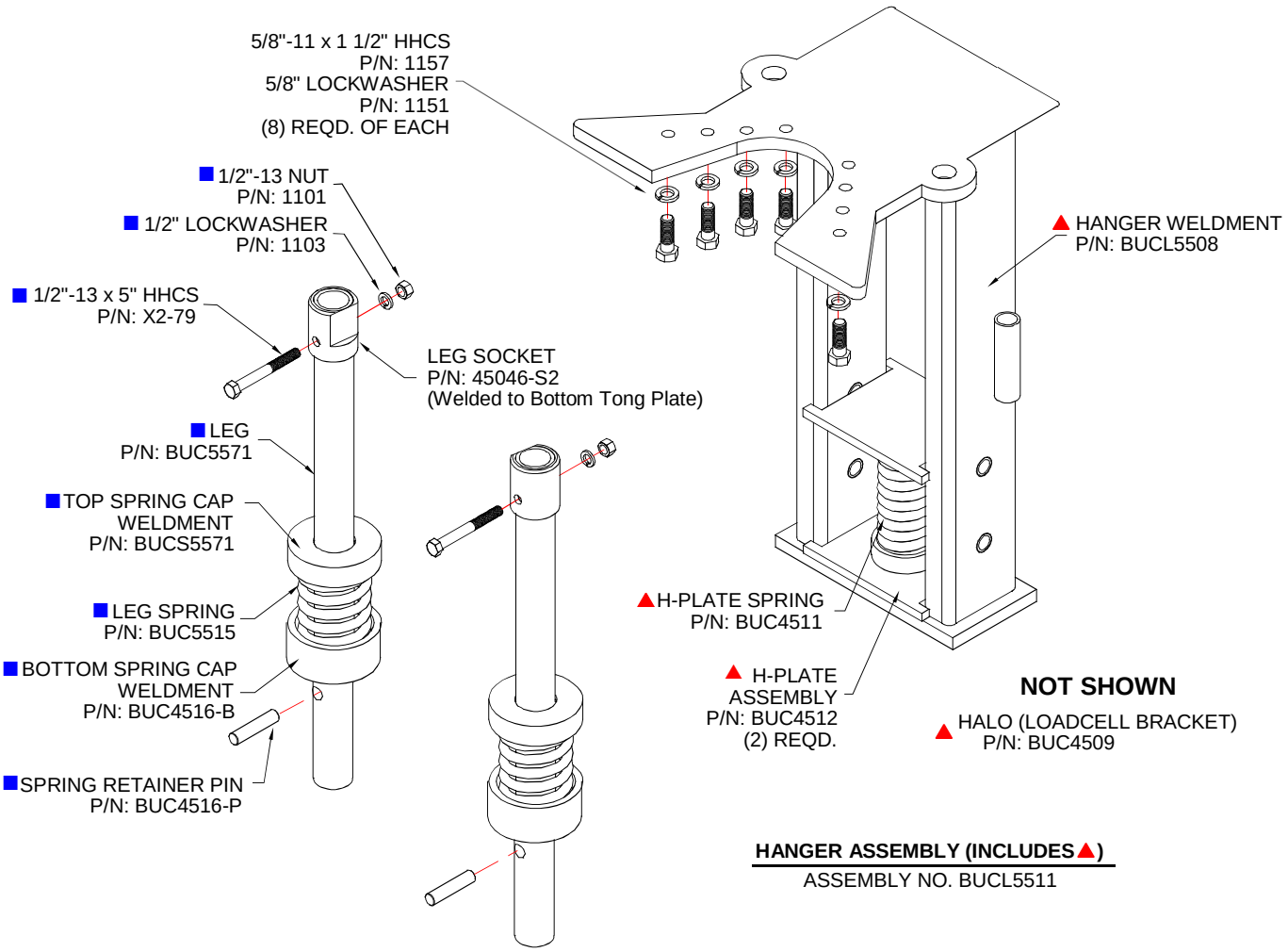
REV. #	LOG #	DATE
1		05/24/07

REF: P:\Manuals\Equip Manuals\Dwgs\BUC6375\BUC6523 Cyl rev1.wpg

NOT SHOWN:

SEE VALVE BANK ASSEMBLY

VALVE PACKAGE
P/N: VP5800-01



LEG ASSEMBLY (INCLUDES ■)

ASSEMBLY NO. BUC5570-04

HANGER ASSEMBLY (INCLUDES ▲)

ASSEMBLY NO. BUCL5511

MOUNTING KIT ASSEMBLY
6 3/8" SHT BACKUP
TO 5 1/2" HT TONG

ASSEMBLY NO. MK6375

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REV. #	LOG #	DATE
		11/03/03

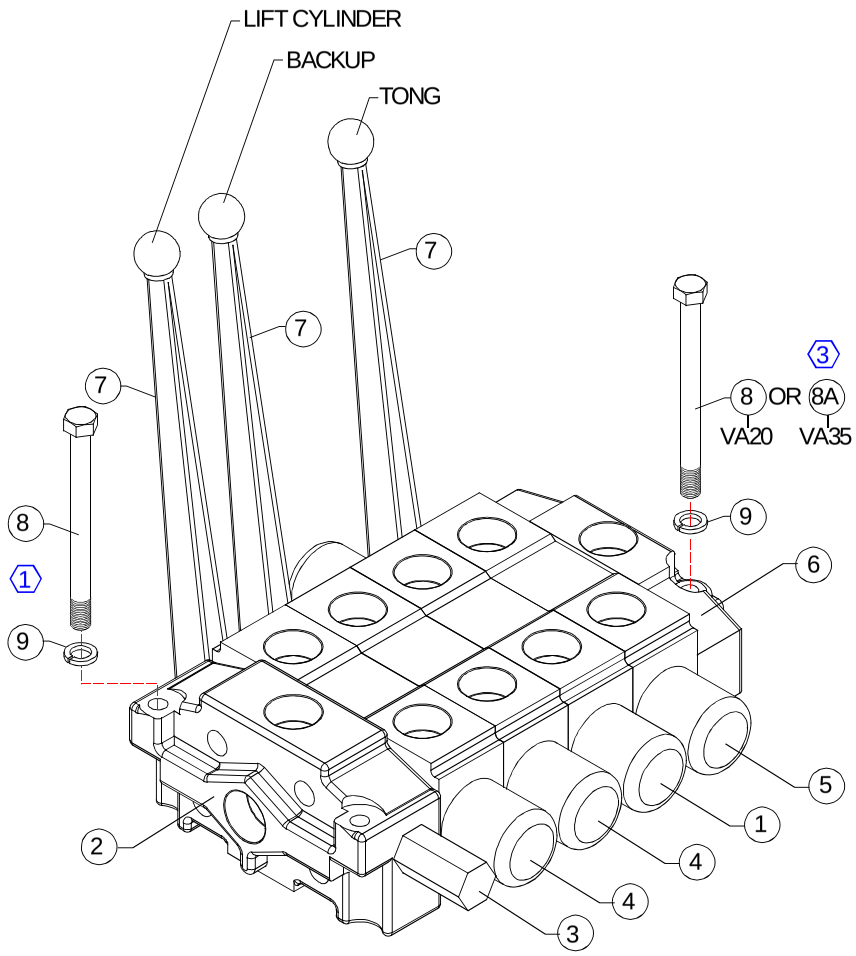
REF: P:\Manuals\Equip Manuals\Dwgs\BUC6375\Mounting Kit.wpg

A20 VALVE BANK ASSEMBLY

Item #	Qty.	Part Number	Description
1	1	55201	CONTROL VALVE ASSEMBLY - MODIFIED VA20-WDA3
			BEFORE 04/15/04
2 OR	1	VA20-MOD	WORK SECTION
			AFTER 04/15/04
2	1	VA20-AA440	INLET VALVE W/O RELIEF
3	1	VA20-MRV-1	RELIEF CARTRIDGE
4	2	VA20-DA3	WORK SECTION
5	1	VA20-MA3	WORK SECTION
6	1	VA20-TR44	OUTLET SECTION
7	3	A20-V1526K-8	A20 8" HANDLE
1 8	3	1072	HHCS 3/8"-16 x 3 3/4" (COMPONENT OF KIT P/N: 4 BANK)
1 9	3	134	LOCKWASHER 3/8" (COMPONENT OF KIT P/N: 4 BANK)

A35 VALVE BANK ASSEMBLY

Item #	Qty.	Part Number	Description
1	1	14213	CONTROL VALVE ASSEMBLY - MODIFIED VA35-WDA4
			BEFORE 04/15/04
2 OR	1	VA35-MOD	WORK SECTION
			AFTER 04/15/04
2	1	VA35-AA440	INLET VALVE W/O RELIEF
3	1	DVG35-HMRV 4	RELIEF CARTRIDGE
4	2	VA35-DA4	WORK SECTION
5	1	VA35-MA4	WORK SECTION
6	1	VA35-TR55	OUTLET SECTION
7	3	A35-V1526K-8	A35 8" HANDLE
1 8	2	X2-40 3	HHCS 1/2"-13 x 4 1/4" 3
3 8A	1	X2-45	HHCS 1/2"-13 x 4 1/2"
1 9 3	3	1103	LOCKWASHER 1/2"



VALVE BANK ASSEMBLY

Rev.	Date	Description
4	08/19/05	Item 3 - Chg.PN from A35-MRV-1 to DVG35-HMRV; ECN#05-0064.
3	12/13/04	Item 8 - Chg. Length from 5" to 4 1/4", PN from X2-79 to X2-40.
		Item 8A - Added Part. Item 9 - Chg. Qty. from 2 to 3.
2	10/21/04	Item 1 - Added VA20-MOD & VA35-MOD for Production after 04/15/04.
1	06/10/02	Item 8 & 9 - Added Part.

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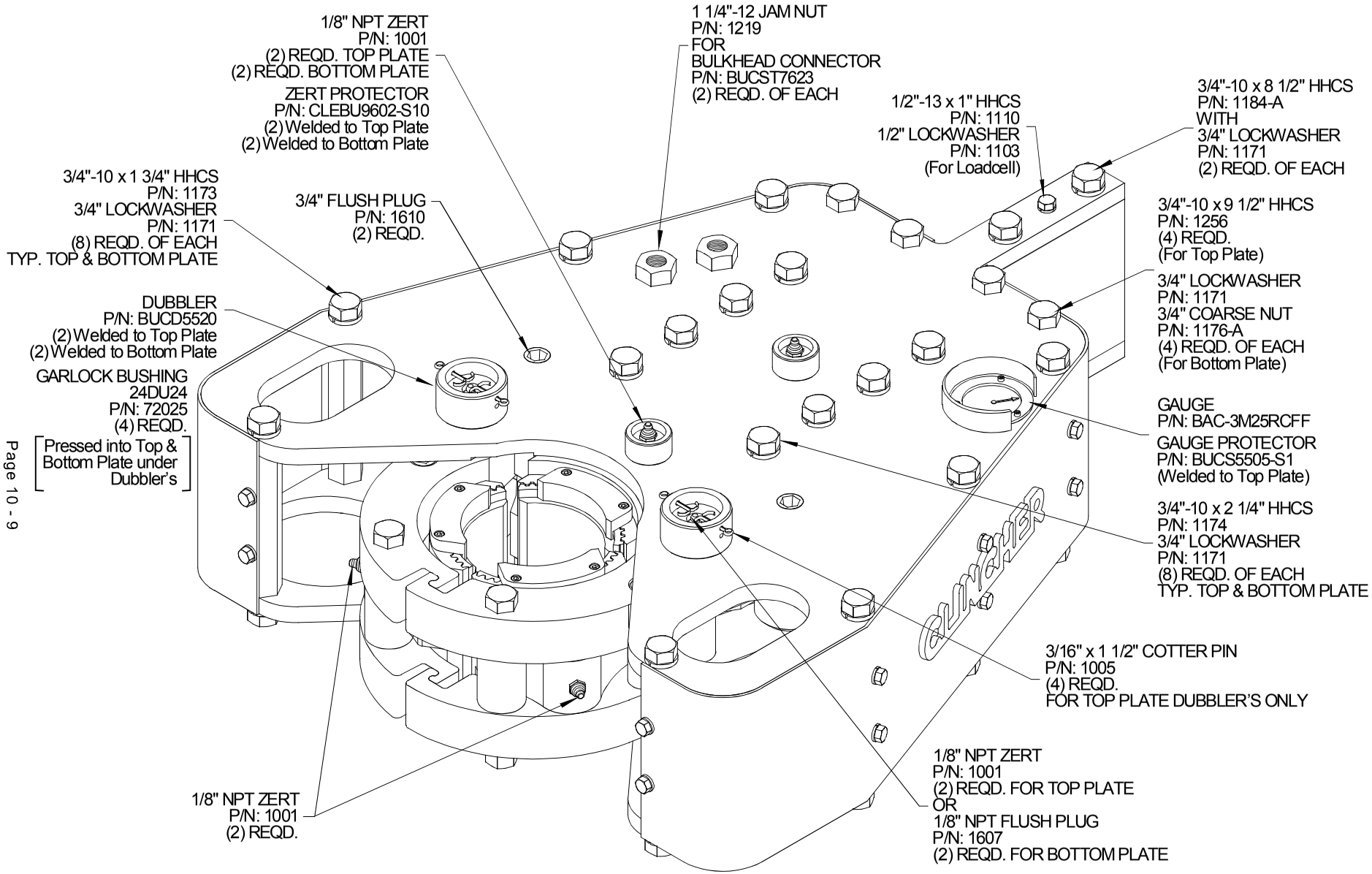
REV. #	LOG #	DATE
4		08/19/05

REF: P:\Manuals\Equip Manuals\Dwgs\Valves\Valve Bank 4 rev4.wpg



5 1/2" LOCKJAW™ DRILL PIPE BACKUP

ASSEMBLY NO. BUCD5500

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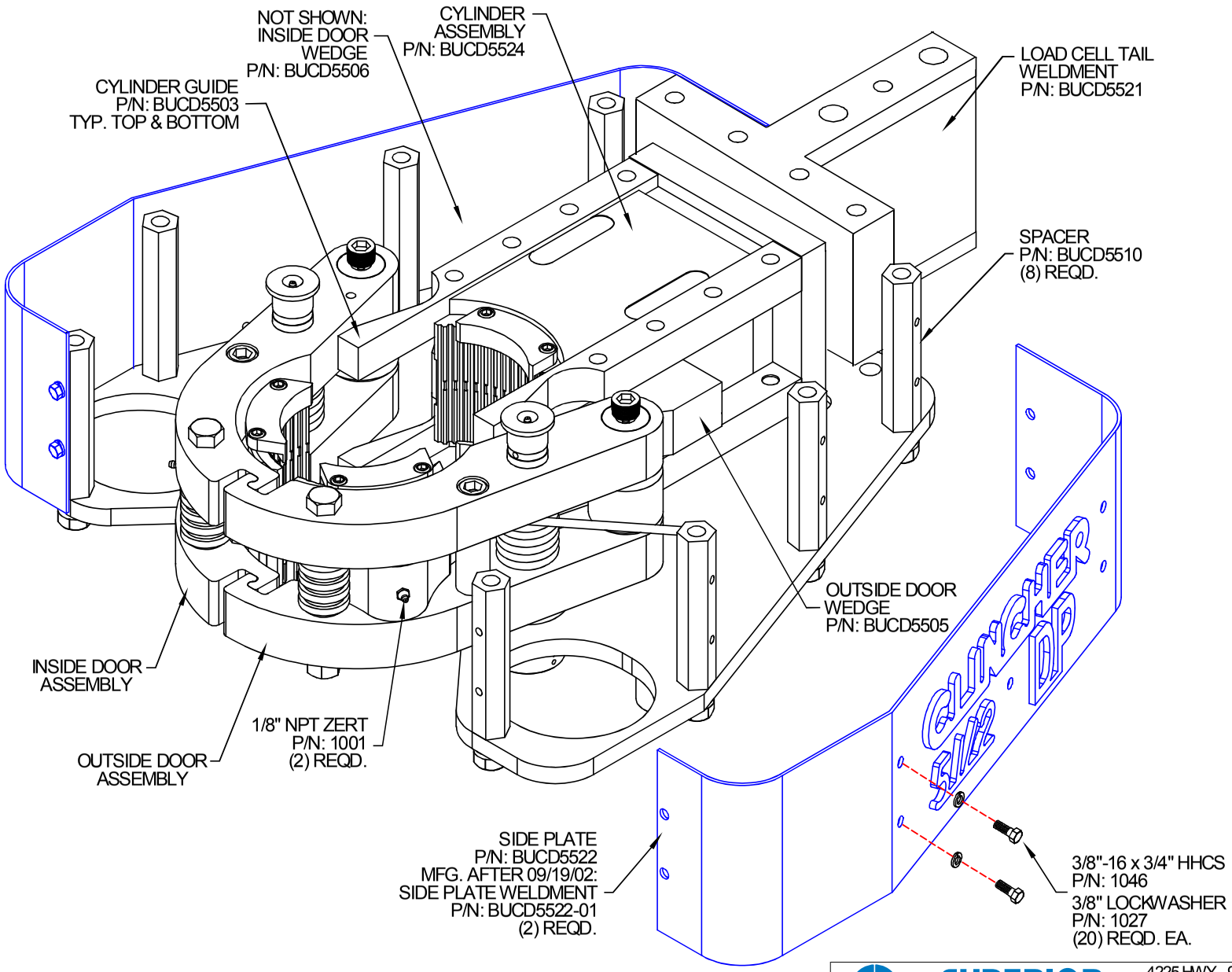
REV. #	LOG #	DATE
		11/27/01

REF: P:\Manuals\Equip Manuals\Dwgs\BUCD5500\Assembly.wpg



5 1/2" LOCKJAW™ DRILL PIPE BACKUP

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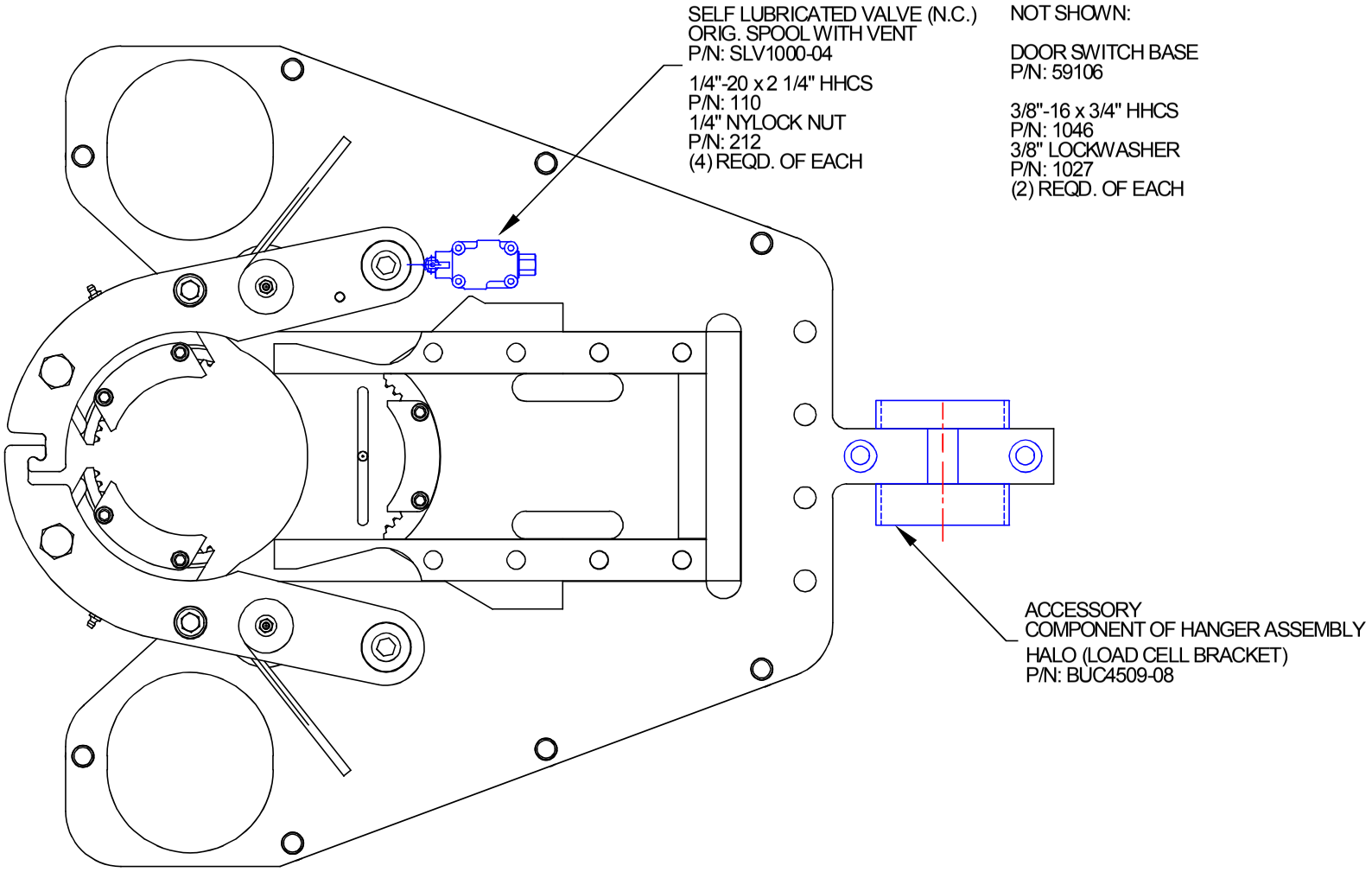
REV. #	LOG #	DATE
2		03/15/07

REF: P:\Manuals\Equip Manuals\Dwgs\BUCD5500\Assy woPlate rev2.wpg



5 1/2" LOCKJAW™ DRILL PIPE BACKUP

TOP VIEW WITHOUT TOP PLATE

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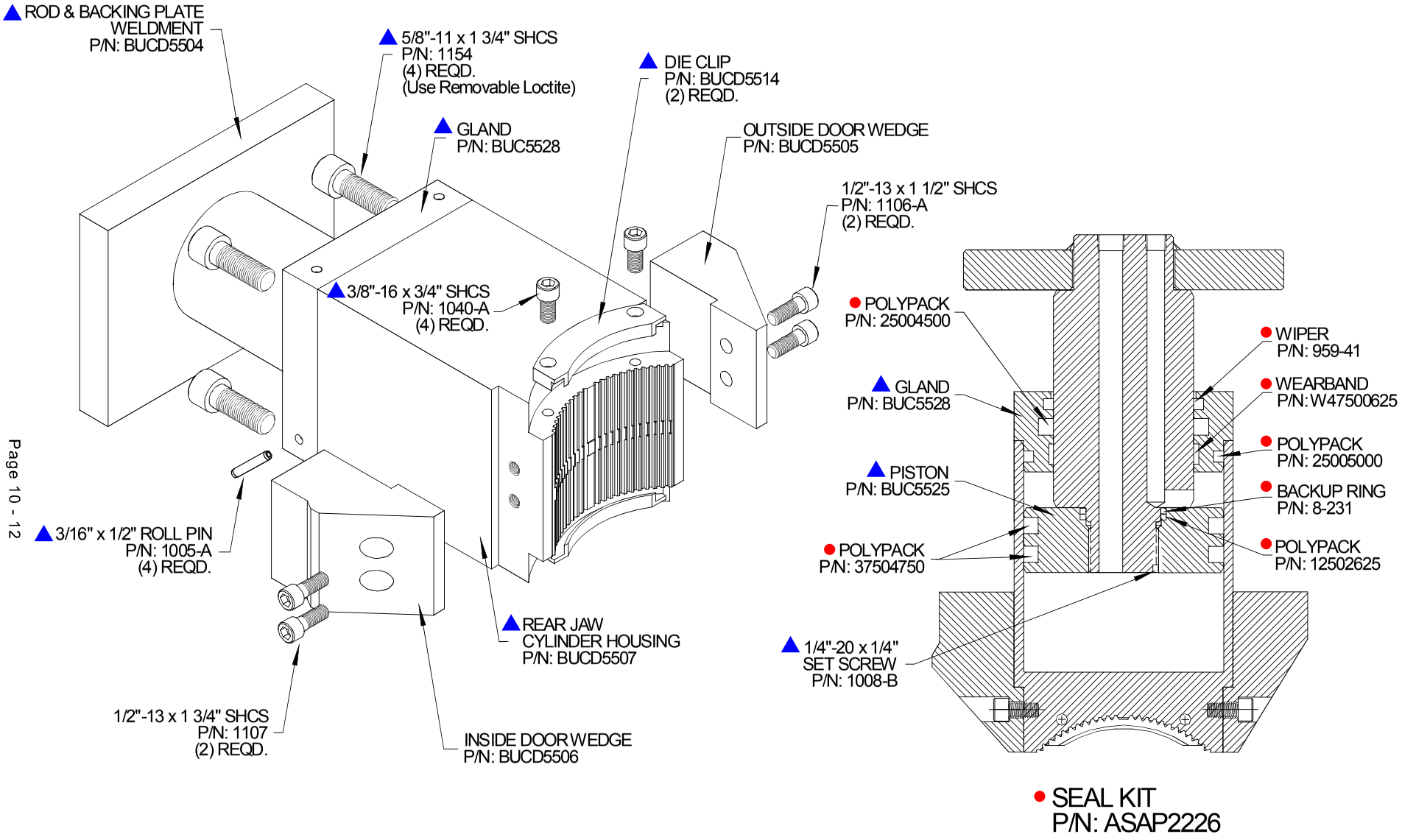
REV. #	LOG #	DATE
2		03/15/07

REF: P:\Manuals\Equip Manuals\Dwgs\BUCD5500\Top View woPlate rev2.wpg


▲ ROD & BACKING PLATE WELDMENT P/N: BUCD5504
▲ 5/8"-11 x 1 3/4" SHCS P/N: 1154 (4) REQD. (Use Removable Loctite)
▲ DIE CLIP P/N: BUCD5514 (2) REQD.
▲ GLAND P/N: BUC5528
OUTSIDE DOOR WEDGE P/N: BUCD5505
1/2"-13 x 1 1/2" SHCS P/N: 1106-A (2) REQD.
▲ 3/8"-16 x 3/4" SHCS P/N: 1040-A (4) REQD.
● POLYPACK P/N: 25004500
● WIPER P/N: 959-41
▲ GLAND P/N: BUC5528
● WEARBAND P/N: W47500625
● POLYPACK P/N: 25005000
▲ PISTON P/N: BUC5525
● BACKUP RING P/N: 8-231
● POLYPACK P/N: 37504750
● POLYPACK P/N: 12502625
▲ 3/16" x 1/2" ROLL PIN P/N: 1005-A (4) REQD.
▲ REAR JAW CYLINDER HOUSING P/N: BUCD5507
▲ 1/4"-20 x 1/4" SET SCREW P/N: 1008-B
1/2"-13 x 1 3/4" SHCS P/N: 1107 (2) REQD.
INSIDE DOOR WEDGE P/N: BUCD5506
● SEAL KIT P/N: ASAP2226

5 1/2" LOCKJAW™ DRILL PIPE BACKUP

CYLINDER ASSEMBLY

ASSEMBLY NO. BUCD5524 ▲

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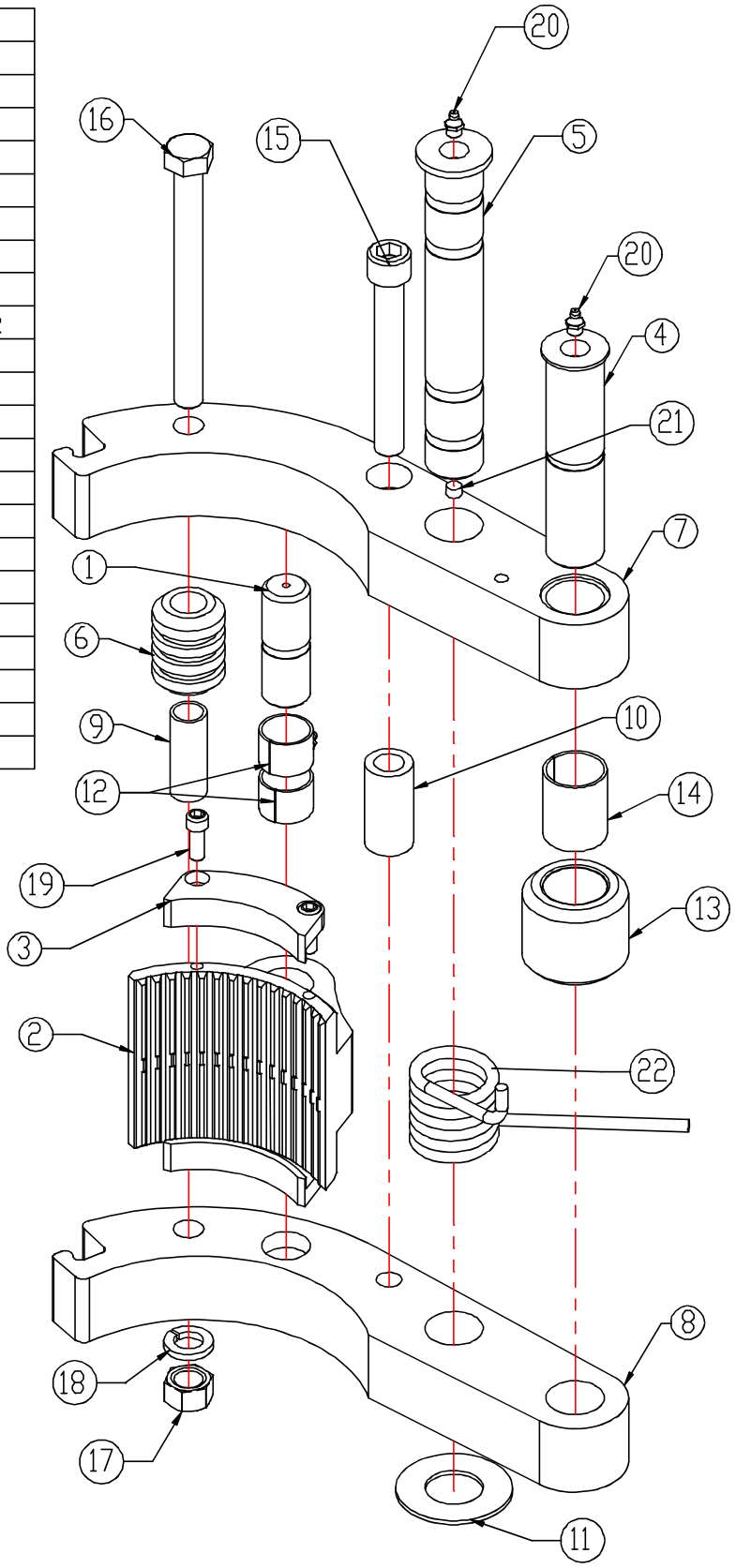
REV. #	LOG #	DATE
1		03/16/07

REF: P:\Manuals\Equip Manuals\Dwgs\BUCD5500\BUCD5524 Cyl rev1.wpg

Item #	Qty.	Part Number	Part Name
1	1	bucd5511	INSERT PIN
2	1	BUCD5513	PIVOTING INSERT
3	2	BUCD5514	DIE CLIP
4	1	BUCD5515	ROLLER PIN
5	1	BUCD5516	PIVOT PIN
6	1	BUCD5523-01	GROOVED DOOR SPRING
7	1	BUCD5517	INSIDE DOOR TOP PLATE
8	1	bucd5518	INSIDE DOOR BOTTOM PLATE
9	1	BUCD5541	FRONT DOOR SPRING SPACER
10	1	BUCDP8509	DOOR SPACER
11	1	2025	TONG DOOR THRUST SPACER
12	2	20DU16	DU BEARING 1 1/4" X 1"
13	1	BUCD5519	DOOR ROLLER
14	1	BUCS4027	DU BEARING 1 1/2" X 2"
15	1	1177-A	3/4"-10 X 5 1/2" SHCS
16	1	1255	HHCS 3/4"-10 X 7 1/2"
17	1	1176-A	3/4" GR. 8 NUT
18	1	1171	3/4" LOCKWASHER
19	4	1041	3/8-16x1 1/4 SHCS
20	3	1001	1/8 NPT ZERT
21	1	1607	1/8" FLUSH PLUG
22	1	BUCD5525	TORSION SPRING



INSIDE DOOR ASSEMBLY

ASSEMBLY NO. BUCD5536

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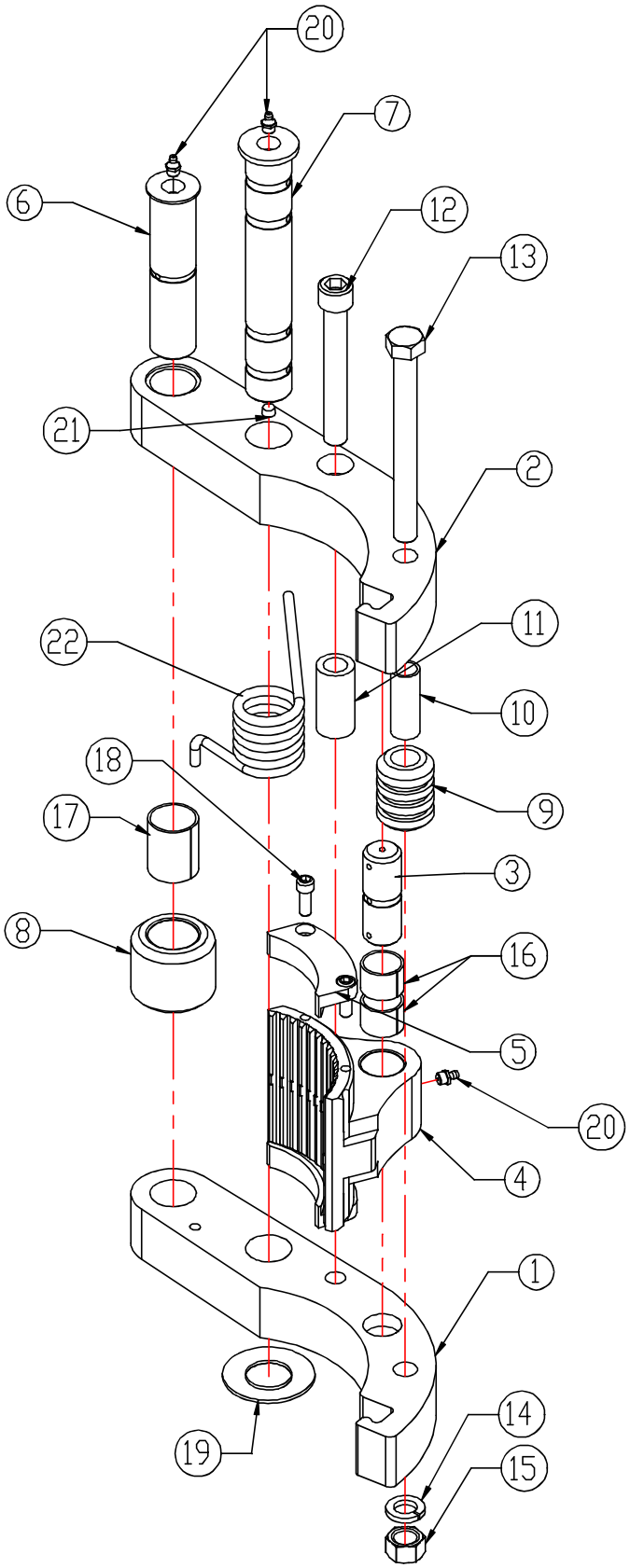
REV. #	LOG #	DATE
		03/19/07

REF: P:\Manuals\Equip Manuals\Dwgs\BUCDT5500\BUCD5536 Door I.wpg



Item #	Qty.	Part Number	Part Name
1	1	bucd5501	OUTSIDE DOOR BOTTOM PLATE
2	1	BUCD5502	OUTSIDE DOOR TOP PLATE
3	1	bucd5511	INSERT PIN
4	1	BUCD5513	PIVOTING INSERT
5	2	BUCD5514	DIE CLIP
6	1	BUCD5515	ROLLER PIN
7	1	BUCD5516	PIVOT PIN
8	1	BUCD5519	DOOR ROLLER
9	1	BUCD5523-01	GROOVED DOOR SPRING
10	1	BUCD5541	FRONT DOOR SPRING SPACER
11	1	BUCDP8509	DOOR SPACER
12	1	1177-A	3/4"-10 X 5 1/2" SHCS
13	1	1255	HHCS 3/4"-10 X 7 1/2"
14	1	1171	3/4" LOCKWASHER
15	1	1176-A	3/4" GR. 8 NUT
16	2	20DU16	DU BEARING 1 1/4" X 1"
17	1	BUCS4027	DU BEARING 1 1/2" X 2"
18	4	1041	3/8-16x1 1/4 SHCS
19	1	2025	TONG DOOR THRUST SPACER
20	3	1001	1/8 NPT ZERT
21	1	1607	1/8" FLUSH PLUG
22	1	BUCD5525	TORSION SPRING

OUTSIDE DOOR ASSEMBLY

ASSEMBLY NO. BUCD5535

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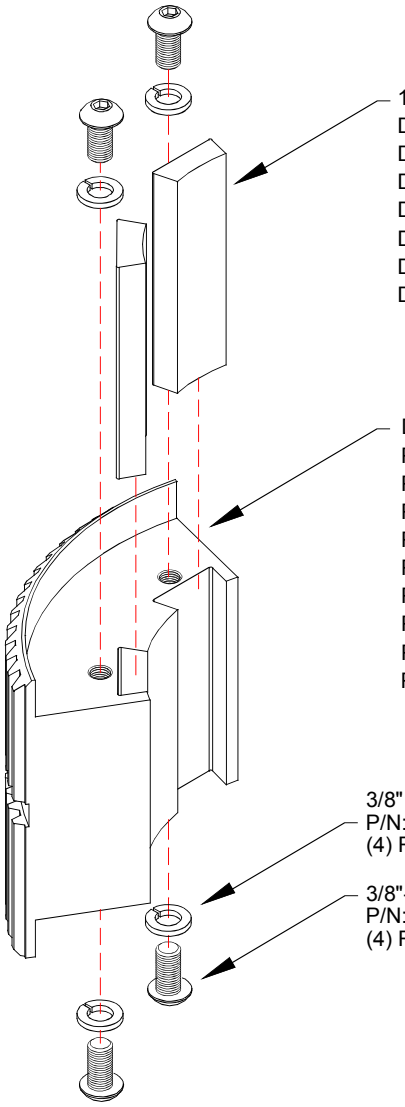
		03/16/07
REV. #	LOG #	DATE

REF: P:\Manuals\Equip Manuals\Dwgs\BUCDT5500\BUCD5535 Door O.wpg



1 1/4" x 3 7/8" DOVETAIL STRIP DIES
DTI1601 - 1/2" Thick
DTI1601D - 1/2" Thick Diamond
DTI1622 - 9/16" Thick
DTI1632 - 5/8" Thick
DTI1642 - 11/16" Thick
DTI1661 - 13/16" Thick
DTI1662 - 1 1/4" Thick

DOVETAIL DIE ADAPTERS

P/N: BUDT55-02375	2 3/8"	P/N: BUDT55-04125	4 1/8"
P/N: BUDT55-02875	2 7/8"	P/N: BUDT55-04250	4 1/4"
P/N: BUDT55-03125	3 1/8"	P/N: BUDT55-04500	4 1/2"
P/N: BUDT55-03375	3 3/8"	P/N: BUDT55-04750	4 3/4"
P/N: BUDT55-03500	3 1/2"	P/N: BUDT55-04875	4 7/8"
P/N: BUDT55-03625	3 5/8"	P/N: BUDT55-05000	5"
P/N: BUDT55-03750	3 3/4"	P/N: BUDT55-05125	5 1/8"
P/N: BUDT55-03875	3 7/8"	P/N: BUDT55-05250	5 1/4"
P/N: BUDT55-04000	4"	P/N: BUCX55005500	5 1/2"

3/8" LOCKWASHER
P/N: 134
(4) REQD.

3/8"-16 x 3/4" BUTTON HEAD CSX
P/N: 1061
(4) REQD.

5 1/2" LOCKJAW™ DRILL PIPE BACKUP DOVETAIL DIE ADAPTER

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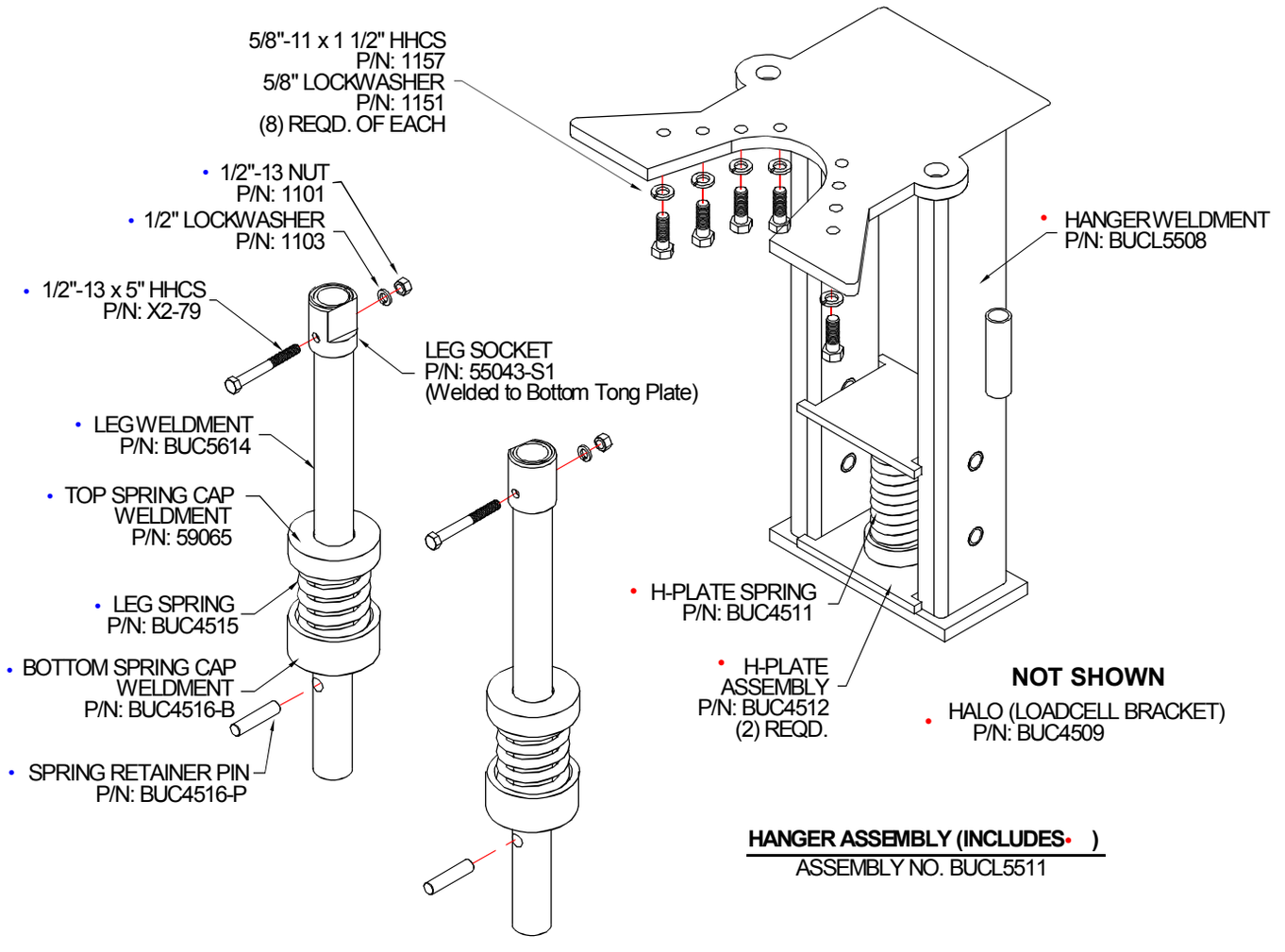
REV. #	LOG #	DATE
1		01/18/08

REF: P:\Manuals\Equip Manuals\Dwgs\BUCD5500\Die Adapter DT rev1.wpg

NOT SHOWN:

SEE VALVE BANK ASSEMBLY

VALVE PACKAGE
P/N: VP5800-01



LEG ASSEMBLY (INCLUDES •)
ASSEMBLY NO. BUC5570-01

HANGER ASSEMBLY (INCLUDES •)
ASSEMBLY NO. BUCL5511

MOUNTING KIT ASSEMBLY
5 1/2" LOCKJAW™ DP BACKUP
TO 5 1/2" HT TONG

ASSEMBLY NO. MK5550-01

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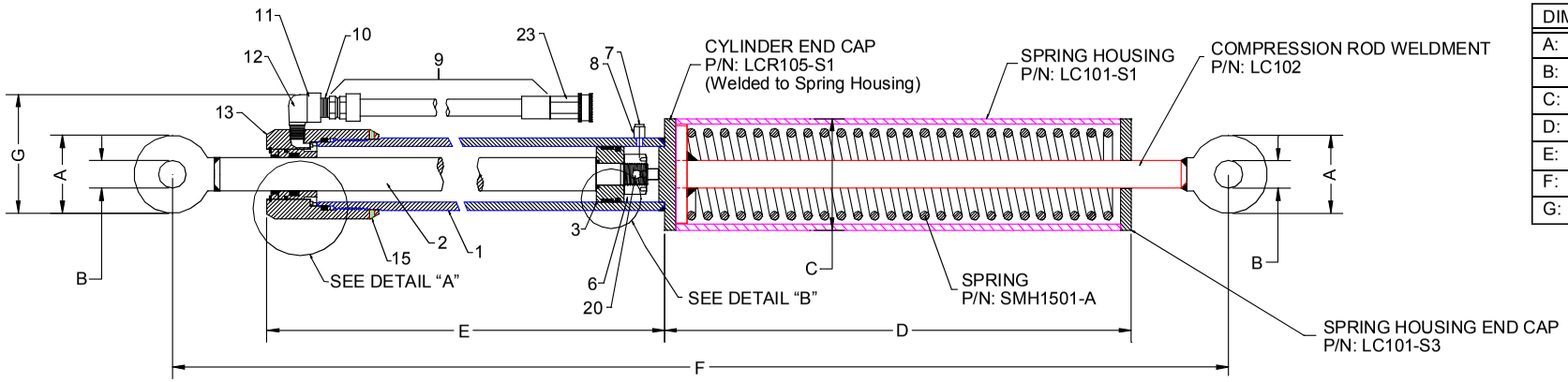
		10/29/03
REV. #	LOG #	DATE

REF: S:\Equip Manuals-Dwgs\BUCD5500\Mnt Kit CLES5500HT.wpg

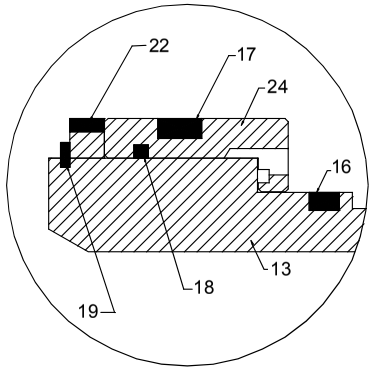


DIMENSIONAL DATA	
A:	3 1/2" x 3/4"
B:	1 1/4"
C:	5"
D:	21"
E:	40 1/4"
F:	70"
G:	5 5/16"

SEAL KIT P/N: ASAP100

BILL OF MATERIALS

Item	*Qty.*	*Description*	*P/N*
1	1	HYD/AIR CYLINDER BARREL	LCR105
2	1	CYLINDER ROD WELDMENT	LCR112
3	1	PISTON	LCR106
4	1	WEARBAND	W25000500
5	1	POLYPACK 2 1/8" x 2 1/2" x 3/16"	18702125
6	1	1"-12 SLOTTED HEX NUT	1209
7	1	1/2" FLUSH PLUG W/ 1/8" ORIFICE	1657
8	1	1/2" HALF COLLAR	1380
9	1	1/2" x 120" HOSE ASSY. MNPT x FJIC	LCR107-A
10	1	3/8" MNPT x 1/2" MJIC ADAPTER	1466
11	1	3/8" STREET EL W/ORIFICE	LCR109
12	1	3/8" STREET EL	1450
13	1	GLAND CAP	LCR119
14	---	----------	----------
15	2	1/4"-20 x 3/8" SET SCREW	1015
16	1	O RING 2 7/8"ID, 3 1/4"OD, 3/16"W	2-336
17	1	POLYPACK 1 1/2" x 1 7/8" x 3/8"	18701500-375
18	1	O RING 2"ID, 2 1/4"OD, 1/8"W	2-226
19	1	INTERNAL SNAP RING (N-1300-225)	1947
20	1	1/4" x 1 1/2" ROLL PIN	1008-A
21	1	O RING 1"ID, 1 1/4"OD, 1/8"W	2-214
22	1	SEAL NP CR14938	CR14938
23	1	1/2" FEMALE SNAPTITE Q.D.	1430
24	1	GLAND	LCR113



DETAIL "A"
SCALE: 3X

SPECIFICATIONS - A

MAXIMUM SPRING TRAVEL (PRELOAD TO SOLID) ..... 8.0 in.

MAXIMUM ALLOWABLE LOAD (SPRING FULLY COMPRESSED) ..... 3.043 lbs.

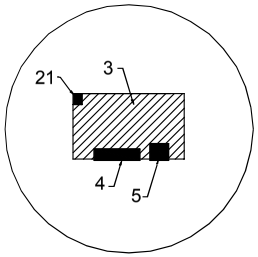
PRESSURE REQUIRED TO LIFT MAXIMUM ALLOWABLE LOAD ..... 969 psi

MAXIMUM ALLOWABLE INTERNAL PRESSURE ..... 3,000 psi

CYLINDER I.D. ..... 2.50 in.

ROD O.D. ..... 1.5 in.

STROKE ..... 34.94 in.



DETAIL "B"
SCALE: 3X

LIFT CYLINDER ASSEMBLY

ASSEMBLY NUMBER LCR100-A

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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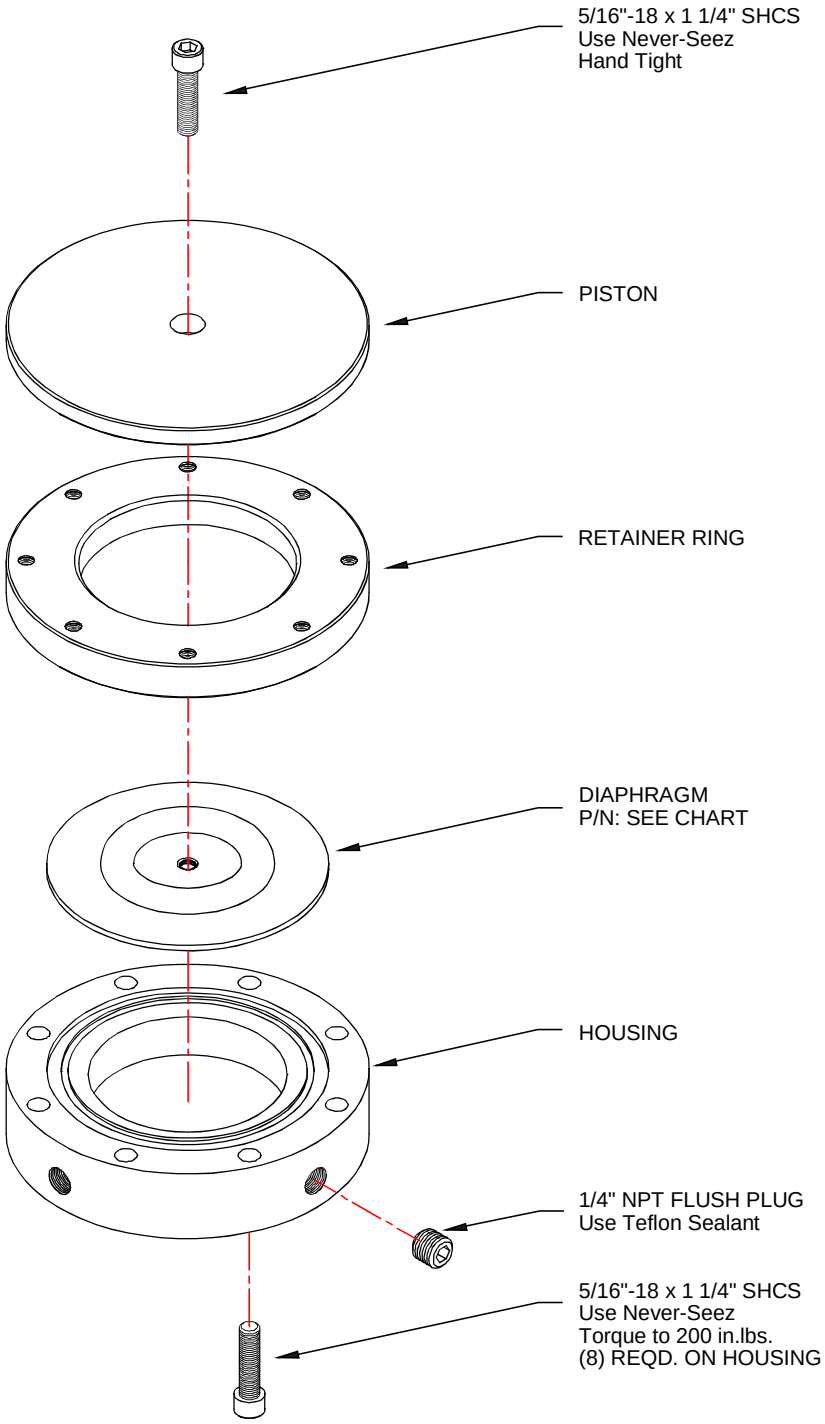
SECTION 12 CLINCHER® LOADCELL and TORQUE GAUGE

The **CLINCHER®** Tong and Backup are available in versions which accommodate compression load cells or tension style load cells. All information contained in this Technical Manual refers to products which utilize compression load cells. Contact SUPERIOR for information concerning products using tension load cells.

Part Number	SM15-29 C or SM20-29C
Torque Rating	15,000 ft lbs or20,000 ft lbs
Handle Length	29 inches
Loadcell Type	Compression
Loadcell Manufacturer	SUPERIOR MANUFACTURING & HYDRAULICS
Loadcell Part Number	CLC200
Torque Gauge Mfr.	TOTCO or equivalent
Torque Gauge Size	6"
Gauge Mount	“L” Bracket
Hose Length	6 ft.
Assembly Documentation	Calibration Certificate

CLINCHER® Load cells and Torque Gauges are produced by several manufacturers. The information provided by MD TOTCO or Acadiana Oilfield Instruments may not be applicable to all torque gauges or load cells. This reference information is provided with the permission of MD TOTCO and Acadiana Oilfield Instruments.



LOAD CELL SIZE	DIAPHRAGM P/N
6.44 SQ.IN.	CLC203
8.0 SQ.IN.	CLC205
12.0 SQ.IN.	CLC206
16.1 SQ.IN.	CLC207
25.0 SQ.IN.	CLC208

COMPRESSION LOAD CELL

SUPERIOR Manufacturing & Hydraulics
4225 HWY. 90 EAST
BROUSSARD, LA 70518
(318) 837-8847

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1		07/03/02

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SECTION 12 CLINCHER® LOADCELL and TORQUE GAUGE

To request copy of
Compression Torque System
Technical Manual,
please contact:

Superior Manufacturing & Hydraulics
4225 Hwy. 90 East
Broussard, LA 70518
Phone: 337-837-8847
Fax: 337-837-8839
www.superior-manf.com

SECTION 13 MOTOR SERVICE MANUALS

To request copy of Rineer Motor Service Manuals, please contact:

Superior Manufacturing & Hydraulics
4225 Hwy. 90 East
Broussard, LA 70518
Phone: 337-837-8847
Fax: 337-837-8839
www.superior-manf.com

SECTION 14 VALVE TECHNICAL DATA

To request copy of Valve Technical Data, please contact:

Superior Manufacturing & Hydraulics
4225 Hwy. 90 East
Broussard, LA 70518
Phone: 337-837-8847
Fax: 337-837-8839
www.superior-manf.com